This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

**Usage guidelines**

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

**About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

GODFREY LOWELL CABOT SCIENCE LIBRARY
*of the Harvard College Library*

This book is
FRAGILE
and circulates only with permission.
Please handle with care
and consult a staff member
before photocopying.

Thanks for your help in preserving
Harvard's library collections.

Eleventh

# ANNUAL REPORT

OF THE

# Croton Aqueduct Department,

MADE TO THE COMMON COUNCIL OF THE CITY OF NEW
YORK, JANUARY 2, 1860.

## FOR THE YEAR 1859.

NEW YORK:
CHAS. W. BAKER, PRINTER, 29 BEEKMAN STREET.
1860.

Eng 1070.29

1870, Dec. 20.
Gift of
Geo. Augustus Cushing,
of New York.

# Croton Aqueduct Department,

ORGANIZED

UNDER A LAW OF THE LEGISLATURE

Of the State of New York,

PASSED APRIL 11, 1849.

## Croton Aqueduct Board.

PRESIDENT COMMISSIONER,
**MYNDERT VAN SCHAICK,**

COMMISSIONER,
**THOMAS B. TAPPEN,**

ENGINEER,
**ALFRED W. CRAVEN.**

### Bureau of Pipes, Sewers and Pavements.

AARON B. ROLLINS, Chief, and Water Purveyor.

### Bureau of Water Rents.

REVO C. HANCE, Registrar.
WILLIAM FARDON, Deputy Registrar.

## DOCUMENT No. 2.

---

# BOARD OF ALDERMEN,

JANUARY 2, 1860.

The Annual Report of the Croton Aqueduct Department was received, laid on the table, and ordered to be printed.

D. T. VALENTINE, *Clerk.*

---

CROTON AQUEDUCT DEPARTMENT,
December 31, 1859.

*To the Honorable the Common Council*
*of the city of New York:*

In compliance with law, the Croton Aqueduct Board respectfully presents to your Honorable Body the Annual Report of the Department under their charge.

The classification of the report is in accordance with our books; and the accompanying statistics will give you the operations of the Department during the year.

For a more detailed description, we would refer to the accompanying schedules, giving the receipts and expenditures, under their several heads; the number and length of the sewers built; the streets paved, and the pipe laid;

together with the work on repairing streets, and wells and pumps, which have all been performed satisfactorily to the Board. The repairing of streets is spoken of more at length under its proper head.

On reference to the different schedules which relate to appropriations, it will be observed that to the appropriations for each head of account the balance of the preceding year is added, and at the footing is shown the balance which is applicable to the service of the succeeding year, when any remains unexpended.

The receipts of the Department have been :

| | |
|---|---|
| For Water Rents | $748,930 62 |
| Penalties on Water Rents | 10,319 83 |
| Permits to connect with Sewers | 21,723 00 |
| Permits for Street Vaults | 17,616 74 |
| Old materials sold | 1,629 25 |
| Total | $800,219 44 |

### Aqueduct Repairs and Improvements.

The details of work under this head, unless affected by unusual contingencies, vary but little, either in character or cost, from year to year. They usually consist of the necessary fencing along the line of the Aqueduct, and in keeping the whole of the works in a proper state of preservation. The fencing on the line and the repairs of the embankments, the retaining walls, the masonry about the dam, the bridges and culverts, and the reservoirs, embrace work which is extended throughout the year; the most minute watchfulness to detect any point requiring attention, and the most prompt action in making the necessary repair, being a rigidly exacted rule along the entire line. The repairs to the conduit itself, however, or what is generally called the repair of the interior masonry, is not extended through the year; but, as it requires the entire shutting off the water from the city during its prosecution, the whole work necessary is compressed into the shortest period possible.

The number of feet of fence, put up since our last report, is 11,568; the usual amount of care and labor, both on the exterior and interior of the Aqueduct, have been given during the year, and the Board has the gratification of reporting the whole structure in a satisfactory condition.

The yearly examination of the interior was made on the 27th, 28th and 29th October, by Mr. J. C. Winder, Assistant Engineer. The water was shut off from the city seventy-six hours, and the whole length of the Aqueduct (more than thirty-eight miles) was emptied, examined, and thoroughly repaired within that time.

The expenditures, under this item of improvements, have been slightly increased by some grading of the river banks at the Dam, and by additional light and air shafts constructed through the eastern embankment of the Receiving Reservoir into the pipe-vault below.

The total expenditure, in supervision and repairs of the Aqueduct, from the Croton Dam to the Receiving Reservoir, and all other incidental work under this head, has been $18,046 22. The details will be found in schedule No. 7.

On commencing the work of repair to the western wall of the Distributing Reservoir, injured by the burning of the Crystal Palace, in October, 1858, the damage to the cornice and parapet was found to be somewhat greater than was apparent before the removal of the portions of masonry affected. The substantial part of the repairs, however, have been made, and the whole will be completed as soon as practicable, after the weather permits the resumption of work in masonry in the spring. The appropriation for these repairs was asked for under the head of "Water-Pipes and Laying." and the expenditures will be found under that head; the Distributing Reservoir having been so classed, from its being situated within the pipe distribution. It is proposed, however, in the coming year, to include it under the head of Aqueduct Repairs and Improvements. Under this head, it may also be appropriate to state, that stations have been established along the line of the works, at which are kept continuous and careful records of the fall of rain, the temperature of the water in the Aqueduct, and the temperature of the atmosphere.

The observations on the temperature, both of the air and water, are made three times in each day. The rain-guage adopted, is that approved and used by the Smithsonian Institute, at Washington. The form of meteorological tables and record books are also those adopted by the Smithsonian Institute, with such modifications as were necessary to adapt them to our special purpose. The points of observation are severally at Croton Dam, or First Division, Third Division, the Sixth Division, Receiving Reservoir, and Distributing Reservoir; and the observations are made and recorded by the several superintendents of those divisions. It is also proposed to establish another point of observation near the centre of the mountainous district composing the water-shed or basin of the

Croton river, above the Croton Dam. As these records are kept by our own Superintendents, and the maintenance is consequently attended with no additional expense, other than the slight first cost of the instruments and books, the number of them is not considered larger than is desirable for accurate verification of the results sought to be obtained.

### Croton Water Works Extension.

Our principal work, under this head, is the new reservoir. The work done is but a continuance of that of the past year, consisting generally of the formation of the embankment, building the slope walls, excavating rock and earth within the basins, and completing that portion of the Aqueduct which lies within the embankment.

This work has been prosecuted by the contractors, Messrs. Fairchild, Walker & Co., with skill and fidelity. From the progress made during the past two seasons, we may expect that the entire work under their contract will be completed during the ensuing summer.

The total amount of work done up to the 30th November last, was as follows:

| | | |
|---|---|---|
| 675,807 | cubic yards of | earth excavation. |
| 171,268 | " | rock do. |
| 90,697 | " | puddle and puddle bank. |
| 311,055 | " | embankment. |
| 7,724 | " | broken stone prepared. |
| 4,102 | " | do. placed in embankment. |
| 170 | " | paving. |
| 18,280 | " | do. laid in cement mortar. |
| 1,185 | " | brick wall do. do. |
| 22,761 | " | concrete. |
| 95,583 | square feet of | sheet piling. |

Certificates in favor of the contractors, have been issued by the Board, up to the 30th November instant, amounting to $501,392 49--the deduction of $75,000, under the contract, being first made.

The immediate supervision of the work continues under the efficient management of George S. Greene, Esq.

The Board regrets to be obliged to add, under this head, that the progress of the work is still impeded by the contest in regard to the construction of the gate houses. The contract for their construction was awarded by this Board on the 26th of October, 1858, and sent to the Common Council for confirmation on the 28th of October. It was awarded to Messrs. Baldwin & Jaycox, as the lowest bidders, under the statute. No definite action of the Common Council was had until the fifth of September, 1859, when a resolution was passed, without the approval of the Mayor, directing this Board to have the gate-houses, Aqueduct, and their appurtenances of the new Reservoir constructed by Fairchild, Walker & Co., under their contract for making the embankments of said Reservoir; the price for the several kinds of work embraced in the gate-houses to be agreed upon between this Board and the said contractors; excepting on such items as are embraced in the contract for the embankments, which latter items it was directed by the resolution should be paid for at the rate mentioned in said contract for the embankments.

The Counsel to the Corporation decided this resolution to be legal, but obedience to it was prevented by an injunction obtained at the suit of Messrs. Baldwin & Jaycox; and after its expiration, by another injunction at the suit of the Attorney-General of the State on behalf of the people of the State, under the effects of which latter injunction the Board is still restrained from action.

Without entering into a discussion of the merits of the controversy, the Board deem it due to themselves to state, that the original action and judgment of the Board have been sustained by the courts in all the decisions and opinions that have been expressed. Until the gate-houses are completed, the work done on the embankments now under contract, and which will be completed in the coming season, cannot be made available. In the inevitable and great delay to this much required and most important work, the Croton Aqueduct Board see much damage to the public interests, but cannot feel otherwise than gratified that in no respect can the ill consequences be imputed to them.

The maps and calculations of the topographical surveys of the Croton Valley have been completed during the year. They place within the archives of the Department accurate knowledge of the resources of the entire valley—enabling the Board to decide at once as to the cost and availability of any site or sites for storage reservoirs which may be under consideration, and, in general, embracing all the information in respect to the valley which can bear upon any question of present or future supply of water to the city from the Croton river.

### Water-Pipes and Laying.

The number of feet laid this year, is 17,029, for which the expenditure has been $92,452 01.

Instructed by the principle adopted in the resolution of the Common Council, of October 6, 1849, the Board has, since that period, ordered that water-pipes should be laid wherever the condition, which is prescribed in that resolution, could be fulfilled, viz: "In streets or avenues, where the rents to be received from the water will equal the interest on the cost of laying the pipes." This direction has been pursued with little variation or abatement from its terms. The regulation has saved large premature expenditures of money, and that portion of the interest on the cost of laying the pipes, which could not be collected in rents from a few buildings erected in different localities. The rule is highly useful in enabling the Board to decline compliance with improper applications, and should not be repealed, but it may be relaxed without injury to the city, and with advantage to citizens whose buildings are situated at no great distance from the pipes already laid.

With these impressions, the Board proposes to reduce the rate of interest to five per cent. on the money to be expended, and intends to prosecute the work of extending the lines of pipe the ensuing year to the utmost possible degree which may be authorized by the appropriation for that service.

### Sewers--Repairing and Cleaning.

The business of cleaning the sewers was transferred from the Department of Streets to this Department in 1846. The construction of sewers was placed here by the law of 1849. When the law was carried into effect, the two services were blended, and formed one account, so far as it has reference to the cleaning, repairing and rebuilding of old sewers or parts of them, which is work not done on trust account, and includes man-holes, culverts and covers, as exhibited in schedule No. 10, in which it will be perceived that by far the largest part of the expenditure of $31,081 00 has been for building, rebuilding and repairing man-holes, culverts and sewers.

Schedule No. 18 is incidental, and furnished for the purpose of showing an instance of the care which is observed, to understand the progress of events.

The excess of the receipts for permits to construct drains to enter sewers, to the close of 1857, over the expenditures, was $90,901 92. The receipts for 1858 and 1859 were less than in several of the previous years, owing probably to the revulsion of 1857 and the erection of a less number of buildings, and the expenditures were greater, arising from an increase of repairs, etc., which caused an increase of the expenditures over the receipts, of $15,214 85, leaving the balance $75,687 07.

The reconstruction in 1860 of two sewers or parts of sewers, will tend to reduce the balance at the end of that year—as these rebuildings are estimated to cost $26,000. Eventually, the expenditures in this form will exceed the whole receipts for permits. In consequence of the examination which has been made into this subject, it has become evident that the preceding head of account must be separated into two heads: the one, for sewers, rebuilding and repairing; and the other, for sewers cleaning.

### Street Expenses and Paving.

The expenditure under this head of account is $77,299 11. (See Schedule No. 11.)

The business of repairing the streets has been prosecuted throughout the largest portion of the city, with the utmost diligence, and with twenty-one gangs of men at work until toward the close of the season, when the appropriation for that service was nearly exhausted. There does not appear to be any end to the labor.

The cobble-stone pavements, which were laid before the work came into this Department, appear to have been constructed without attention to the specifications of contracts, and to get out of order almost as fast as they are mended. In those commercial parts of the city in which they still exist, and on the lines of omnibuses, incessant repairs are necessary to keep them in good traveling condition. The stones have not been selected, and are laid in numerous streets with no regard to uniformity of size. Many of them are so large as to be entitled to the name of bowlders. The Board, therefore, suggests that it would be good policy for the city, and promote the comfort of the public, as well as best for the interests of the parties who are to be assessed, to discontinue the construction of cobble-stone pavements; and that if any exception whatever is made to the measure, it should only be in streets in which it is apparent from their location that no trade or travel of consequence will, for many years, exist.

### Wells and Pumps, and Repairing.

Of these, sixty-eight have been removed, and the wells filled up or covered over, by order of the Common Council. The expenditures under this head of account will be found in Schedule No. 12.

### Statistical Tables.

The balance in bank is $308 61, and one thousand dollars is asked for next year's service. (See Schedule No. 13.)

### Salaries.

The expenditures for salaries in 1858 were $26,810 00. This year they amount to $26,962 14, as exhibited in Schedule No. 14.

The President submits, as a matter of public interest, a condensed view of the method observed in transacting the financial business of the Department, and keeping its books of account and record.

The preceding titles represent the eight heads of appropriations and expenditures under which the books of account are kept.

The appropriations which have been made by the Common Council for each head of account, constitute their credits respectively.

The expenditures which have been required in the prosecution of the portion of the business of the Department to which they relate, form the debits of the accounts.

In the Bureau of the Registrar of Water Rents, are kept twenty-two ward-books, containing, on examination this year, more than ninety thousand entries of water-payers—the Registrar himself keeping a set of daily cash-books.

In the Bureau of the Water Purveyor, the books in which the proposals or bids for contracts on trust accounts are recorded, books of certificates for payments on sewer and pavement contracts, and several subsidiary books, and a cash-book, in which are entered the receipts of the Water Purveyor for permits for street-vaults, are kept by the contract clerk.

The Clerk to the Board keeps the permit-book for drains, a book to receive the returns of the weights of pipes and other instruments and materials, from the pipe yard, a book for contracts for pipes and all other contracts to be paid out of the appropriations for the eight heads of account, and in relation to the new Reservoir.

The cash received by the Water Registrar for water-rents, penalties and fines, and that which is taken by the appropriate officers for permits for drains, and for the construction of street-vaults, and for old materials sold, is credited in the book of accounts, and debited from the receipts of the City Chamberlain.

The deposits of the Registrar with the Chamberlain are made every day at the close of business. Those made by the other officers are weekly, as the amounts are small, and occasionally no permit is issued.

After the pay-rolls, bills for materials purchased, documents for debts, which arise out of contracts, under the eight heads of account, verified or certified, as required by ordinance, and copied in duplicate, they are examined by the President in detail; having been found to be correct, he draws his requisitions on the Comptroller, which, together with the original vouchers, are delivered to that officer, and the money due is paid by him.

Formerly, the balances of the appropriations which remained unexpended, at the termination of each year, were left in the treasury. This system was continued by this Department, until the close of 1857, and the lapsing is so stated in the annual report of 1858; but the balances of the last year having been by the Comptroller added to the appropriations for 1859, they have assisted the Department in extending the ordinary work in the city, sufficiently to meet, in some degree, the peremptory resolutions of the Common Council, and the numerous and pressing applications from citizens for the laying of pipes, and repairs of streets, most of which were not contemplated in the estimates for the year.

So long as this new arrangement, which forbids the lapsing of balances shall continue, they will be carried to the next year's accounts, and will form available means, which will be deducted from the estimate to the Comptroller, in September or October of each year, to enable him to state to the Common Council the several amounts of appropriation which the service of the succeeding year will require. The proper deductions have been made in the estimate for 1860.

Obliged to estimate the balances which may remain unexpended, before the work of the year is ended, they can only be furnished as approximate to what they may become, and the deductions from the estimates will necessarily be liable to the same degree of uncertainty.

The expenditures for Croton Water-works extension are paid by the Comptroller, out of sales of stock. The requisitions are drawn in the same manner as are those which relate to the other heads of account, excepting those which are drawn for payments on account of the new Grand Reservoir, which are special in character, certified by the Engineer in charge of the work, and examined and signed by the Chief Engineer, the Assistant Commissioner and the President.

### Trust Accounts.

For the construction of wells and pumps.

For the construction of sewers.

For the construction of new pavements, with trap-blocks or cobble-stones.

For the construction of that portion of trap-block repavement, instead of cobble-stone taken up, which is paid by assessment.

These are not heads of account in our books, and are adjusted by certificates; and separate books for sewers and pavements are kept by the Assistant Commissioner, in which the title of each work is recorded; the names of the contractor, inspector and surveyor, the prices of each work which has been awarded to the lowest bidder, and confirmed by the Common Council; and the quantities, as they are returned by the surveyors, on which the calculations are to be tested. which are made by the Contract Clerk, to reach the cost of each structure.

A summary statement, and the amount of each certificate, when it is prepared by the Contract Clerk, and ready to be signed by the Board, is entered on the opposite page of the appropriate account. When the work is completed, and the entries all made, they form a permanent and correct account of work and of the certificates issued for their settlement.

An explanation appears to be necessary in relation to repavements, with trap-blocks, as a substitute for the cobble-stones which are taken up.

The certificates which are transmitted to the Assessors on this description of pavements, comprehend the quantities which are returned by the Surveyors, as customary in other cases; and those returns must, necessarily, include both that proportion of the work, the cost of which is to be paid by the city, out of the tax levy, and that which is to be paid by owners of the property by assessment. The ordinances of the Common Council, which direct the work to be done, prescribe the portion of the cost of each work which the owners and the city are to pay. By this direction the Assessors make out their lists of assessment against the property benefited, and the Comptroller charges the city with the amount which the Common Council has assumed.

The ordinances are not uniform in their directions of the proportions of the expense which are to be paid by the owners and by the city. In the instance of Columbia street and Avenue D, from Grand street to Eleventh street, the Common Council assumed the whole expense. On the completion of this work, it was found to be $35,979 14, without the charges of the Assessors. In other instances, it was ordered by ordinances, to be one-half, and in several one-third of the cost. These facts are related for the purpose of showing that, to guard against error, it is necessary to establish, by law or ordinance, a uniform rule of apportioning the expense of this particular description of pavement.

It has happened, that delays have occurred in the confirmation of contracts, which have obstructed business, tended to unsettle the minds of contractors, and disobliged citizens who expected to be benefited by the completion of the work.

## Waste of Water.

The number of large buildings erected within a few years, has been so great, that the insufficiency of our present supply, to meet all wants and contingencies to which the city is liable, continues to increase. The prevention of waste, and a reasonable economy, has again been inculcated in newspapers and printed circulars, and it is time that the proprietor of every house, hotel and factory, should pay more attention to his own safety. The Board has made such arrangements to repress the waste, as they judge to be necessary, and will exact the penalties without mitigation.

The Central Park has six one-inch taps. An application was made to the Board by the Commissioners of the Park, for a supply for their skating-pond, by a syphon over the wall of the Receiving Reservoir, which it was impossible to grant at the time, owing to the low state of water in the Reservoir.

## St. Nicholas Hotel.

The protracted suit which was commenced in the latter part of 1855, by an injunction procured by the proprietors of this immense establishment, to prevent the water being shut off for non-payment, for their extraordinary consumption, was this month argued in the Supreme Court, on appeal from the decision of the Court below, and again decided in favor of the city. The arguments of the Court established the principles contained in the sections of the law of 1849, which relate to this matter, and assign the reasons on the strength of which they were drawn. They constitute a perfect justification of the proceedings of the Board, in relation to the application to buildings, of water-meters, and of the price which was charged for the water, according to ordinance.

### Drinking Fountains.

The Board has asked for an appropriation of $1,500, for the ensuing year, and will proceed to the erection of fountains in the opening spring.

### Unpleasant Taste of the Croton Water.

In the early part of August last, a report was circulated, that the purity of the water must have become injured by admixture with some foreign substance. The officers of the Department proceeded immediately to ascertain its condition. Being satisfied that a strong impregnation of vegetable matter had occurred, the Board determined to obtain professional information from chemists, in relation to the origin and character of the substance which had given an unpleasant flavor to the water, and, for that purpose, employed Messrs. Chilton and Torrey. The Board were relieved from their anxiety on the subject by the intelligence communicated in the reports, that the vegetable substance, which had tinctured the water, was not unwholesome, and of short duration in its growth. It may be inferred from the reports, that the plant does not frequently appear, and that it grows in the bottom of the lake. As they relate to a most important subject, reports of those distinguished gentlemen are printed for preservation.

NEW YORK, August 25, 1859.

To MYNDERT VAN SCHAICK,
THOMAS B. TAPPEN, and
A. W. CRAVEN, Esqs.,
*Croton Aqueduct Board:*

GENTLEMEN:—In compliance with the request received from your Honorable Board, that I would make a chemical investigation and analysis of the Croton water, for the especial purpose of ascertaining the cause of its peculiar unpleasant condition, I beg leave to offer the following report as the result of my investigation:

On the 12th of August, instant, I received from Mr. A. W. Craven, Chief Engineer of the Works, three demijohns of the water, numbered and labelled as follows:

"No. 1. Water from the mouth of the Aqueduct, at the Receiving Reservoir.

"No. 2. From the east side of the Gate-house, southeast corner of Receiving Reservoir, South Basin.

"No. 3. Water from Forty-second street Reservoir."

On emptying the water from each of the demijohns into separate large glass jars, it presented the same general appearance in all. The color, when viewed thus in bulk by reflected light, was of a faint brownish hue, but by transmitted light it had a shade of green. It was nearly transparent, but, upon close inspection, some minute particles were observed suspended throughout the mass. The taste and odor of each was the same as that of the water drawn from the hydrants in the city, and, in these particulars closely resembled the water of ponds and marshes abounding in vegetable matter. After remaining at rest for a few hours, a deposit of light flocculent matter was observed at the bottom of each of the jars containing the water.

Portions of this matter were removed and examined with a microscope, and, in each case numerous minute aquatic plants and silicious remains of brittle worts (Desmideæ), with a few living animaculæ, were easily detected. A similar sediment was obtained from a new filter attached to the hydrant in my laboratory, by allowing the water to pass through it for a short time. In this concentrated form it was of a decidedly green color.

By the application of nitrate of silver to each of the samples of the water, they were found to change color quickly, under the influence of solar light, to a deep claret color. The change of color being greater than I had observed by similar treatment of Croton water on former occasions, indicated that it contained an unusual amount of vegetable matter.

One gallon (231 cubic inches or 58,327 grains,) of the water No. 1, was carefully evaporated in a porcelain dish to dryness; and the dry residuum, which was of a brown color, was found to weigh 3·68 grains. This was heated in a platinum capsule until the organic matter was burnt off. During the combustion it emitted the odor of burning vegetable matter, mixed with a small quantity of animal substance. It was again weighed, and found to have lost 0·92 of a grain. The solid contents, therefore, of one gallon of water No. 1, consisted of—

| | | |
|---|---|---|
| Inorganic (mineral) matters | 2·76 | grains. |
| Organic (chiefly vegetable) matters | ·92 | " |
| Total | 3·68 | " |

One gallon of water No. 2, similarly treated, gave—

| | | |
|---|---|---|
| Inorganic matters | 2·769 | grains. |
| Organic matters | 0·930 | " |
| Total | 3·699 | " |

One gallon of water No. 3, treated in the same way, gave

| | | |
|---|---|---|
| Inorganic matters | 2·765 | grains. |
| Organic matters | 0·940 | " |
| Total | 3 705 | " |

A qualitative analysis of the inorganic matters showed the presence of lime, magnesia, sulphuric acid, chloirne, soda, and a trace of potassa.

The organic matter was mainly composed of extremely minute aquatic plants, of which an account will be given by Dr. Torrey, in his report; but I detected in it also crenic acid, in combination with the alkaline bases.

To determine the relative proportions of the several constituents of the water, I made a quantitative analysis of three gallons of the water No. 3. The results thus obtained, when reduced by calculation, gave the following, as contained in one gallon:

| | |
|---|---|
| Chloride of sodium | 0·4040 |
| " of calcium | 0·1036 |
| " of magnesium | 0·1466 |
| Sulphate of lime | 0·3536 |
| Carbonate of lime | 0·8366 |
| " of magnesia | 0·3900 |
| " of soda, and a trace of carbonate potassa | 0·2700 |
| Silica, alumina and a trace of iron | 0·1698 |
| | 2 6742 |
| Organic matters | 0·9158 |
| Total | 3·5900 grains. |

While the preceding investigation was in progress, I was requested, on the 16th instant, to visit the Croton Lake, in company with Mr. M. Van Schaick, the President, and Mr. J. C. Winder, Assistant Engineer. We traversed the entire length of the lake, a distance of five miles, taking samples of water from different parts of it. The first sample was procured from that part of the dam where the water first enters the aqueduct. The next about one-fourth of a mile distant. The next sample about a mile further on. The fourth from the vicinity of Pine's bridge. Fifth, from Kisco Creek, where it mingles with the water of the lake. Lastly, a sample from the head of the lake.

A physical examination, made at the time of taking the samples, revealed nothing unusual or different from what I had observed in the water obtained from the reservoirs in the city.

The odor and taste were similar, and the same kind of minute floating particles were observed in each, when examined with the aid of a magnifier. The extraneous particles were most abundant in the water from the dam.

They were found to be less apparent as we approached the head of the lake, where the water was clear and transparent.

On the following day, I again visited the lake in company with Prof. Torrey, who, through some misunderstanding, did not accompany us on the first excursion.

Upon arriving at the lake, we learned that Mr. Adamson, the keeper of the dam and gate, had observed, since the preceding day, an unusual quantity of a light green matter floating on the water near the dam.

Upon the slightest agitation of the water this green substance was diffused so as to appear lost; but with care he had procured a pail full of it, which he had reserved for our inspection. Some of the same material we procured ourselves from the surface of the lake, and we took home with us samples for chemical and microscopic examination.

Before leaving the spot, we had a strong conviction that to this substance might be attributed all the unusual qualities lately observed in the Croton water throughout the city. It had precisely the same taste and odor, but in a very concentrated degree. Of its vegetable nature, we entertained no doubt. A chemical examination of the green matter gave the following results:

A portion of it, mingled with water, was greatly heated and finally boiled. Upon the first application of a moderate heat, the color quickly changed from a green to a light buff color. When near the boiling point, the whole was converted into a thin mucous substance, and, by continuing the heat, the odorous matter nearly all disappeared. Some of the green matter, mixed with water, was submitted to distillation; when the odorous principle passed over in union with watery vapor, and condensed in the receiver as a colorless, transparent liquid, possessing the characteristic flavor of the original substance. A portion of the same green material was agitated with pure sulphuric ether. After subsidence, the ether, which arose to the surface, was separated, and allowed to evaporate. A minute quantity of an oily substance, slightly tinged with green, was thus obtained. The coloring matter was probably due to chlorophyl, the green coloring matter of plants.

When examined with a microscope of high power, the green substance was seen to consist of some minute aquatic plant, a detailed description of which is given by Dr. Torrey.

There was also observed among it a few of the living animalculæ, such as the microscope usually reveals in unfiltered water from fresh-water ponds. It may be worthy of remark, that, so far as I have observed, the apparent number of these living forms is much less in the Croton water now, than I have noticed in former examinations.

It is quite evident that the flavor of the Croton water, so much complained of during the past week or two, is now rapidly disappearing, and that the water has nearly regained its normal condition. I believe the unusual little plant which we have found in it, and which gave it the peculiar flavor complained of, to be of a perfectly harmless character, and, consequently, that the wholesomeness of the water has not been impaired by it in the least degree.

I have drunk freely of it during the time when it was in its worst condition, and have partaken of the green matter which we procured from the lake, in its concentrated state, and also after it had been converted into a jelly by heat, without experiencing any ill effects whatever from it.

Filtration of the water through the porous filters now so much in use, was found to separate effectually all the minute floating particles from it, and thus rendered it more palatable.

Upon comparing the present analysis with the results that I obtained in the year 1836, and again in 1842, as well as with the analysis by Prof. B. Silliman, Jr., in 1845,

**I find that the Croton water at the present day is purer, or in other words, contains a smaller proportion of inorganic and other constituents, than has been found in it since the liberality and wise forethought of our rulers caused the introduction of this source of countless blessings, to our great city.**

**Respectfully,**
**Your obedient servant,**
**JAMES R. CHILTON.**

---

New York, August 25, 1859.

To Myndert Van Schaick,
Thos. B. Tappen, and
A. W. Craven, *Engineer*,
*Croton Aqueduct Board.*

Gentlemen:—At your request, in company with Dr. Chilton, I visited Croton Lake on the 18th instant, for the purpose of ascertaining, if possible, the cause of the disagreeable quality observed in the water distributed through the city, and which had been the subject of serious and general complaint for a week or two previous. On driving down the hill that leads to the dam, and before reaching the lake, we noticed the same musty odor that characterized the water of the hydrants in the city. Mr. Adamson, the gate-keeper, afforded us every facility in prosecuting our researches, and piloted us to various places on the lake. He brought to our notice a bright green substance that had appeared within the last twenty-four hours in the water near the dam. This material had been driven by a favorable wind to the outlet of the lake, where it accumulated so as to form a considerable stratum in quiet recesses near the shore. The water at the time was very low, only a small portion flowing over the dam. A quantity of the water, quite thick with the green material, had been reserved for our examination, and we collected some of it ourselves from the surface of the lake. We soon became convinced that this unusual ingredient was the cause of the peculiar taste and odor of the water. After examining the character of the larger aquatic plants that grew abundantly in the western portion of the lake, and taking new samples of the water from various places, we returned to the city; and I commenced my examinations immediately, before any obvious change had taken place in the properties of the water.

On placing a portion of it under a microscope, it was found to be loaded with little straight filaments, which were composed of oblong-roundish cells in a single row like a string of beads; and in no case did I find these threads to be branching. Most of the cells were about one-third longer than broad, and were filled with a bright green substance, composed of irregular grains. This matter was proved to be chlorophyl, or the green coloring-substance of leaves. Interposed here and there in the bead-like filaments were two other kinds of cells ; the one perfectly spherical, three times the size of the oblong ones; and filled with green spores or seeds, by which the plant is reproduced; the other also spherical, but much smaller, and containing a yellowish fluid, but no green grains. The function of the latter is unknown to me.

There were only a few other kinds of microscopic plants in the water, nearly all of which belong to a particular tribe, called by botanists Desmideæ. In ordinary seasons these constitute the chief vegetable forms existing in the Croton. The number of living animalculæ was also unusually small. In repeated instances, on concentrating the water of the city hydrants, at the time that it exhibited the offensive properties complained of, I found its character precisely those of the water taken at the dam. The day after collecting the sample of bright green water at the lake, I submitted it again to the microscope, and was surprised to find that all the beaded filaments had disappeared; but there were floating in the liquid, in a separate state, the large spherical green cells, and the smaller yellowish ones. I had noticed, in my first examination, several of the filaments break up by the successive bursting of the little cells. Without doubt, the myriads of little plants contained in my sample had disappeared in the same way. I have since repeatedly seen the filaments break up in water taken from the hydrants. They undergo dissolution much more quickly when they are accumulated by the filter, or when they are confined in a bottle. After the rupture of the cells, the water retains its green color for some time, but it finally becomes bleached from the decomposition of the chlorophyl. The bright green water from the Croton Dam became quite viscid in less than twenty-four hours, and the following day it was somewhat putrid, and emitted a little ammonia, but not the least trace of sulphuretted hydrogen. Most of the spherical cells just noticed, remained entire, but the green ones had evidently matured their spores or seeds.

Before the green water had decomposed, I evaporated a portion to dryness with great care, so as to avoid scorching it. Sulphuric ether, agitated with the residue, became of a lively grass-green tint, but without materially diminishing the color of the mass. The solution, after spontaneous evaporation of the ether, left a thick brownish-green matter which was soluble in ether and in alcohol, but not in water. It was, doubtless, one of the coloring bodies of chlorophyl.

A portion of the green water was then boiled for some time. It lost its color and odor, and deposited brownish flakes on cooling. The water that distilled over contained the odorous principle in a concentrated form.

From this examination, and from the researches of Dr. Chilton, I think we are warranted in concluding that the recent offensive condition of the Croton water was owing to a rapid and abundant growth of a microscopic conferva-like plant, which abounds in a volatile odorous principle, soluble to some extent in water. We were extremely fortunate in making our visit to the lake at just the time when a favorable wind drove the little plant (floating by adhering bubbles of oxygen gas) to the outlet, thus bringing within the space of a cubic inch, as many of the filaments as could be separated by filtration from a hogshead of the water a short distance above the dam.

I have not yet satisfied myself as to the origin of these little filaments—whether they are the entire plant, or once constituted a part of a more complex alga. They are more minute than in any true conferva known to me, being only 2500 to the 2000th of an inch in diameter, and from a 50th to the 20th of an inch long. I strongly suspect that they are derived from a species of the genus Nortoc of botanists. This genus usually consists of globular or oblong vesicles, from the size of a duck-shot to the bigness of a plum, and filled with mucus, which is loaded with minute bead-like filaments. When the little bladders burst, the contents escape; the mucus dissolves in the water, and the filaments are set free. Sometimes the waters of small lakes are filled with these small bladders of Nortoc. Since examining the water, I have had no opportunity of revisiting the lake to verify my conjectures.

The question naturally arises, why this plant should have made its appearance in such quantities, and not have been noticed before? We can only reply, that the case is not a singular one. Even in the higher orders of plants it is a common circumstance for a particular species to abound at one time, and then almost disappear for years; and in the lower vegetable tribes, especially those which inhabit the water, is this strikingly the case. The present summer has been unusually favorable to vegetation of all kinds, but what are the circumstances which have so remarkably multiplied this little alga, I have not yet determined. It is a plant of short duration, and should it reappear another season, the probability is, that it will not annoy us long. Very likely more or less of it occurs every summer; but this is the first time that it has been offensively brought to our notice. Even when it was most abundant in the Croton, I don't believe that it communicated any unwholesome quality to the water. Its odor and taste were certainly unpleasant.

While the unpleasant quality of the water continues, the ordinary filter will remove all the suspended matter, and a little fresh-burned vegetable charcoal, or animal carbon, will take away the disagreeable smell and taste. A good method of using the charcoal, is to take some small pieces red hot, and after quenching, inclose them in a little bag of gauze, and suspend them in the water. The charcoal should be removed or reburned every day or two.

I am, gentlemen, very respectfully,
Your obedient servant,
JOHN TORREY.

## State Prison at Sing Sing.

Since the final settlement with the Legislature in the session of 1857, of the contract made with the inspectors of the prison in 1846, for a supply of water, the state has become indebted to the city for three years' supply, as follows:

| | |
|---|---|
| For the year, from May 1st, 1857, to May 1st, 1858, for 51,522,000 gallons, at three-fourths of one cent per 100 gallons, 310 days to the year | $3,864 15 |
| From May 1st, 1858, to May 1st, 1859 | 3,864 15 |
| " " 1859, " " 1860 | 3,864 15 |
| Total | $11,592 45 |

For the purpose of propitiating the Legislature, and avoiding opposition, heavy deductions were made from the price and conditions which are imposed by the ordinance on city consumers. The price was reduced from one cent to three-fourths of one cent. No charge was made for Sundays and holidays for about eleven hundred consumers, none for buildings, and the lowest of four gaugings of the running supply was taken, on which the calculation of the sum to be paid isfounded. Several applications have been made to the Legislature, in this as well as in the previous controversy, and the subjects of them fully argued. Payment for the first year's supply, above stated, was applied for by memorial, in the early part of the session of 1858, and verbal explanations were made to a Committee of the Senate. At the heel of the session, April 15, a law was passed to pay $1,240 00 for that year's supply. Of course it was not accepted. The next application was for two years' supply, to May 1st, 1859, and payment was requested by facts and representations which, it was supposed, would be convincing, and establish the right of the city. By that time three additional gauges had been taken, each of which exceeded the quantity charged. But still, adopting that quantity, the Board charged no additional sum.

The application was not successful. Having exhausted the subject by all the arguments and verbal explanations of which it is susceptible, the Board will simply apply at the present session for payment of the sums due, as stated in the preceding account.

Having found, under a title not apparently applicable to this Department, a law passed by the last Legislature at near the close of the session of 1859, ordering the sale of the prison farm lands, the subject was immediately investigated, and it appeared to the Board that it gave no authority to the inspectors to sell the ground which was occupied by the aqueduct, and runs through the land a distance of 1,690$\frac{77}{100}$ feet. This opinion was confirmed by the Comptroller of the State, in answer to a communication addressed to him. But as no space of ground would be left at the sides of the aqueduct, for approaches to it in case repairs should be required, and as buildings might, in the course of improvements, be erected upon its surface or immediately adjoining, the Board endeavored to enter into an arrangement with the inspectors, for the purpose of procuring the reservation from sale of so much of the ground as would be necessary to protect that important work.

Upon arriving at the office of the Inspectors at Sing Sing, on the day of sale, November 23d last, and after full deliberation with them on several points, and on obtaining their opinion that the law gave them no authority to make a bargain distinct from a sale by auction, they determined to postpone the sale of the two plots through which the aqueduct is built, containing about sixteen acres, until the 25th of May next, and it was so postponed.

The arrangement accords with the views of the Board, in so far as it will afford an opportunity to make an agreement with the Legislature.

The receipts for water rents and penalties, exceed those of last year, $29,142 47.

Schedule No. 27 gives the appropriations and expenditures for the past ten years, with the balance of unexpended appropriations lapsed to the city treasury.

All of which is respectfully submitted.

MYNDERT VAN SCHAICK,
THOMAS B. TAPPEN,
ALFRED W. CRAVEN,
*Croton Aqueduct Board.*

## SCHEDULE No. 1,

### SHOWING THE WEEKLY RECEIPTS OF WATER RENTS.

| | | |
|---|---|---|
| 1859. | | |
| Jan. 6 | $1,621 | 06 |
| " 13 | 2,620 | 11 |
| " 20 | 1,553 | 47 |
| " 27 | 2,110 | 14 |
| Feb. 3 | 3,081 | 72 |
| " 10 | 2,564 | 36 |
| " 17 | 1,686 | 65 |
| " 24 | 2,319 | 60 |
| Mar. 3 | 2,924 | 36 |
| " 10 | 2,482 | 41 |
| " 17 | 2,243 | 78 |
| " 24 | 2,200 | 64 |
| " 31 | 2,626 | 60 |
| Apr. 7 | 1,831 | 11 |
| " 14 | 2,398 | 42 |
| " 21 | 2,786 | 27 |
| " 28 | 1,736 | 87 |
| May 5 | 13,196 | 33 |
| " 12 | 25,107 | 74 |
| " 19 | 23,605 | 64 |
| " 26 | 17,546 | 04 |
| June 2 | 17,289 | 07 |
| " 9 | 19,219 | 77 |
| " 16 | 19,725 | 38 |
| " 23 | 18,662 | 77 |
| " 30 | 19,453 | 48 |
| July 7 | 16,328 | 27 |
| Carried up | $228,922 | 06 |
| Brought up | $228,922 | 06 |
| July 14 | 42,543 | 02 |
| " 21 | 66,428 | 27 |
| " 28 | 101,215 | 74 |
| Aug. 4 | 114,335 | 01 |
| " 11 | 7,705 | 35 |
| " 18 | 5,386 | 38 |
| " 25 | 7,664 | 78 |
| Sept. 1 | 10,091 | 79 |
| " 8 | 8,140 | 90 |
| " 15 | 8,652 | 65 |
| " 22 | 8,689 | 97 |
| " 29 | 7,530 | 82 |
| Oct. 6 | 11,335 | 33 |
| " 13 | 12,873 | 03 |
| " 20 | 16,499 | 91 |
| " 27 | 20,013 | 70 |
| Nov. 3 | 20,015 | 16 |
| " 10 | 5,807 | 56 |
| " 17 | 12,475 | 57 |
| " 24 | 7,746 | 57 |
| Dec. 1 | 5,827 | 58 |
| " 8 | 4,237 | 36 |
| " 15 | 4,916 | 16 |
| " 22 | 4,471 | 50 |
| " 29 | 3,364 | 83 |
| " 31 | 2,039 | 61 |
| Total | $748,930 | 62 |

## SCHEDULE No. 2,

### SHOWING THE RECEIPTS FOR PENALTIES ON WATER RENTS.

| 1859. | | |
|---|---|---|
| Jan. 6 | $150 | 55 |
| " 13 | 146 | 40 |
| " 20 | 68 | 55 |
| " 27 | 142 | 05 |
| Feb. 3 | 166 | 78 |
| " 10 | 140 | 85 |
| " 17 | 106 | 80 |
| " 24 | 132 | 80 |
| Mar. 3 | 153 | 45 |
| " 10 | 189 | 10 |
| " 17 | 156 | 00 |
| " 24 | 133 | 05 |
| " 31 | 117 | 75 |
| Apr. 7 | 133 | 20 |
| " 14 | 185 | 15 |
| " 21 | 123 | 90 |
| " 28 | 126 | 45 |
| May 5 | 199 | 30 |
| " 12 | 117 | 80 |
| " 19 | 99 | 45 |
| " 26 | 68 | 70 |
| June 2 | 100 | 95 |
| " 9 | 103 | 95 |
| " 16 | 73 | 95 |
| " 23 | 71 | 25 |
| " 30 | 56 | 40 |
| July 7 | 36 | 90 |
| Carried up | $3,251 | 48 |
| Brought up | $3,251 | 48 |
| July 14 | 48 | 90 |
| " 21 | 52 | 05 |
| " 28 | 91 | 35 |
| Aug. 4 | 315 | 56 |
| " 11 | 250 | 45 |
| " 18 | 158 | 40 |
| " 25 | 186 | 34 |
| Sept. 1 | 250 | 69 |
| " 8 | 155 | 70 |
| " 15 | 148 | 13 |
| " 22 | 158 | 52 |
| " 29 | 202 | 26 |
| Oct. 6 | 242 | 70 |
| " 13 | 316 | 28 |
| " 20 | 358 | 95 |
| " 27 | 573 | 25 |
| Nov. 3 | 685 | 02 |
| " 10 | 476 | 65 |
| " 17 | 527 | 55 |
| " 25 | 536 | 73 |
| Dec. 1 | 381 | 60 |
| " 8 | 203 | 85 |
| " 15 | 247 | 88 |
| " 22 | 169 | 95 |
| " 29 | 205 | 09 |
| " 31 | 94 | 50 |
| Total | $10,319 | 83 |

## SCHEDULE No. 3,

### SHOWING THE WEEKLY RECEIPTS FOR PERMITS TO CONNECT WITH SEWERS.

| 1859. | | |
|---|---|---|
| Jan. 6........ | $120 | 00 |
| " 13........ | 145 | 00 |
| " 20........ | 50 | 00 |
| " 27........ | 140 | 00 |
| Feb. 3........ | 130 | 00 |
| " 10........ | 270 | 00 |
| " 17........ | 420 | 00 |
| " 24........ | 349 | 00 |
| Mar. 3........ | 534 | 00 |
| " 10........ | 390 | 00 |
| " 17........ | 360 | 00 |
| " 24........ | 745 | 00 |
| " 31........ | 590 | 00 |
| April 7........ | 643 | 00 |
| " 14........ | 950 | 00 |
| " 21........ | 500 | 00 |
| " 28........ | 610 | 00 |
| May 5........ | 662 | 00 |
| " 12........ | 725 | 00 |
| " 19........ | 776 | 00 |
| " 26........ | 784 | 00 |
| June 2........ | 510 | 00 |
| " 9........ | 453 | 00 |
| " 16........ | 486 | 00 |
| " 23........ | 322 | 00 |
| " 30........ | 460 | 00 |
| Carried up.. | $12,124 | 00 |
| Brought up.. | $12,124 | 00 |
| July 7........ | 320 | 00 |
| " 14........ | 442 | 00 |
| " 21........ | 350 | 00 |
| " 28........ | 430 | 00 |
| Aug. 4........ | 332 | 00 |
| " 11........ | 420 | 00 |
| " 18........ | 510 | 00 |
| " 25........ | 360 | 00 |
| Sept. 1........ | 340 | 00 |
| " 8........ | 360 | 00 |
| " 15........ | 583 | 00 |
| " 22........ | 412 | 00 |
| " 29........ | 290 | 00 |
| Oct. 6........ | 447 | 00 |
| " 13........ | 440 | 00 |
| " 20........ | 470 | 00 |
| " 27........ | 330 | 00 |
| Nov. 3........ | 500 | 00 |
| " 10........ | 250 | 00 |
| " 17........ | 359 | 00 |
| " 25........ | 354 | 00 |
| Dec. 1........ | 300 | 00 |
| " 8........ | 190 | 00 |
| " 15........ | 260 | 00 |
| " 22........ | 390 | 00 |
| " 29........ | 160 | 00 |
| Total.... | $21,723 | 00 |

## SCHEDULE No. 4,

### SHOWING THE WEEKLY RECEIPTS FOR PERMITS TO CONSTRUCT VAULTS.

| | |
|---|---|
| 1859. | |
| Jan. 6........ | $724 95 |
| " 13........ | 46 95 |
| " 20........ | 0 00 |
| " 27........ | 249 17 |
| Feb. 3........ | 0 00 |
| " 10........ | 275 95 |
| " 17........ | 240 73 |
| " 24........ | 1,342 20 |
| Mar. 3........ | 0 00 |
| " 10........ | 421 78 |
| " 17 ........ | 48 66 |
| " 24........ | 0 00 |
| " 31........ | 339 20 |
| Apr. 7........ | 389 47 |
| " 14........ | 0 00 |
| " 21........ | 698 20 |
| " 28........ | 130 90 |
| May 5........ | 158 55 |
| " 12........ | 110 70 |
| " 19........ | 682 76 |
| " 26........ | 99 00 |
| June 2........ | 121 46 |
| " 9........ | 226 69 |
| " 16........ | 141 09 |
| " 23........ | 0 00 |
| " 30........ | 218 65 |
| Carried up... | $6,667 06 |
| Brought up.. | $6,667 06 |
| July 7........ | 105 05 |
| " 14........ | 693 61 |
| " 21........ | 43 20 |
| " 28........ | 106 80 |
| Aug. 4 ........ | 212 10 |
| " 11........ | 273 37 |
| " 18........ | 0 00 |
| " 25........ | 21 97 |
| Sep. 1........ | 114 75 |
| " 8........ | 0 00 |
| " 15 ........ | 200 32 |
| " 22........ | 178 42 |
| " 29........ | 369 44 |
| Oct. 6........ | 120 00 |
| " 13........ | 153 15 |
| " 20........ | 256 65 |
| " 27........ | 482 97 |
| Nov. 3........ | 112 05 |
| " 10........ | 265 05 |
| " 17........ | 723 63 |
| " 25........ | 3,036 59 |
| Dec. 1........ | 1,529 85 |
| " 8........ | 919 94 |
| " 15........ | 456 15 |
| " 22........ | 442 62 |
| " 29........ | 132 00 |
| Total..... | $17,616 74 |

## SCHEDULE No. 5,

### SHOWING THE AMOUNTS RECEIVED FOR WORK DONE AND OLD MATERIALS SOLD AND ACCOUNTED FOR AS PETTY CASH.

| | | | | |
|---|---|---|---|---|
| 1859. | | | | |
| January | 5, | H. Decker, for stone.... .... | $99 | 60 |
| | 14, | — Hibbard, do ............. | 100 | 00 |
| | 20, | M. White, do ............. | 15 | 00 |
| | 28, | A. Shaler, do ............. | 4 | 00 |
| Feb'y | 16, | Third Avenue Railroad Co., refuse blocks........................ | 212 | 24 |
| March | 1, | C. Smith, repairing over sewer..... | 6 | 01 |
| | 15, | Thomas Baldwin, four loads ballast. | 2 | 00 |
| April | 2, | Masterson, Smith & Co., sleeve .... | 6 | 00 |
| | 5, | Jas. Maloney, old house at Yonkers.. | 20 | 00 |
| | 7, | Eno's Hotel, 2 sleeves.............. | 12 | 00 |
| | 30, | C. Eberspacker, repairing pipe, Laurens and Houston streets......... | 11 | 60 |
| May | 2, | B. Loder, removing hydrant........ | 25 | 00 |
| | 5, | Sackett, Belcher & Co., digging for pipe, Whitehall and Pearl streets . | 6 | 00 |
| | 5, | Hugh Kane, refuse stone .......... | 155 | 30 |
| | 23, | do old stone............. | 3 | 00 |
| June | 1, | Quintard & Whiting, building stone. | 35 | 00 |
| July | 6, | Ogden & Co., stone............... | 8 | 00 |
| | 8, | Andrew Howser, stone............. | 50 | 00 |
| | 16, | Geo. Law, band, 9th av. and 54th st. | 6 | 00 |
| | 18, | Hugh Kane, 118 loads ballast...... | 37 | 76 |
| | 25, | Dannat & Bro., stone.............. | 7 | 00 |
| | 26, | A. S. Reed, removal of hydrant...... | 25 | 00 |
| | 30, | E. V. Haughwought, shutting off tap | 6 | 00 |
| | | Carried forward................ | $852 | 51 |

| | | | |
|---|---|---|---|
| | | Brought forward | $852 51 |
| Aug't | 11, | J. Kirkwood, old stone | $5 00 |
| | 22, | Central Park, new sleeve | 6 00 |
| | 22, | Weehawken Ferry Co., branch pipe and stop-cock | 57 00 |
| Sept'r | 2, | John Bogardus, house at Fordham | 50 00 |
| | 2, | L. W. Scudder, repairing pipe, 117 West Twenty-third street | 13 80 |
| | 19, | M. Gallagher, ballast | 5 00 |
| | 23, | John J. Gallagher, do | 40 00 |
| | 23, | Daniel Carr, do | 16 00 |
| Oct'r | 14, | Davidson, 100 feet bridge stone | 5 00 |
| | 30, | Watson, 1 load stone | 1 00 |
| Nov'r | 3, | Lewis, 100 blocks of stone | 5 00 |
| | 3, | Removing hydrant, Grand street and Broadway | 20 00 |
| | 12, | Dixon, 11 loads stone | 11 00 |
| | 12, | O'Neil & Co., 131 do | 81 87 |
| | 15, | Blumler, 20 feet bridge stone | 1 00 |
| | 17, | Mason, 40 feet do | 2 00 |
| | 26, | Taylor, 1 load stone | 1 00 |
| Dec'r | 1, | Removing hydrant, Franklin square. | 47 20 |
| | 15, | M. Tully, 94 loads ballast | 30 00 |
| | 15, | 16 feet old bridge stone | 2 00 |
| | 19, | Wm. Baird, 260 loads stone | 97 50 |
| | 21, | Hugh Kane, 312 loads ballast | 266 37 |
| | 23, | do 1 patent sleeve | 8 00 |
| | 26, | J. B. Simpson, 1 sleeve | 5 00 |
| | | Total | $1,629 25 |

# SCHEDULE No. 6,

### SHOWING THE PAYMENTS INTO THE CITY TREASURY, AS PER THE RECEIPTS OF THE CITY CHAMBERLAIN.

| 1859. | | | |
|---|---|---|---|
| Jan. | 6 | $2,616 | 56 |
| " | 13 | 2,958 | 46 |
| " | 20 | 1,672 | 02 |
| " | 27 | 2,641 | 36 |
| Feb. | 3 | 3,378 | 50 |
| " | 10 | 3,251 | 16 |
| " | 17 | 2,454 | 18 |
| " | 24 | 4,143 | 60 |
| Mar. | 3 | 3,611 | 81 |
| " | 10 | 3,483 | 29 |
| " | 17 | 2,808 | 44 |
| " | 24 | 3,078 | 69 |
| " | 31 | 3,673 | 55 |
| April | 7 | 2,996 | 78 |
| " | 14 | 3,483 | 57 |
| " | 21 | 4,108 | 37 |
| " | 28 | 2,604 | 22 |
| May | 5 | 14,216 | 18 |
| " | 12 | 26,061 | 24 |
| " | 19 | 25,163 | 85 |
| " | 26 | 18,497 | 74 |
| June | 2 | 18,021 | 48 |
| " | 9 | 20,003 | 41 |
| " | 16 | 20,426 | 42 |
| " | 23 | 19,056 | 02 |
| " | 30 | 20,188 | 53 |
| July | 7 | 16,790 | 22 |
| Carried up | | $251,389 | 65 |

| Brought up | | $251,389 | 65 |
|---|---|---|---|
| July | 14 | 43,727 | 53 |
| " | 21 | 66,873 | 52 |
| " | 28 | 101,843 | 89 |
| Aug. | 4 | 115,194 | 67 |
| " | 11 | 8,649 | 18 |
| " | 18 | 6,054 | 78 |
| " | 25 | 8,233 | 09 |
| Sept. | 1 | 10,797 | 23 |
| " | 8 | 8,752 | 00 |
| " | 15 | 9,584 | 10 |
| " | 22 | 9,438 | 91 |
| " | 29 | 9,342 | 43 |
| Oct. | 6 | 12,145 | 03 |
| " | 13 | 13,782 | 46 |
| " | 20 | 17,615 | 51 |
| " | 27 | 21,399 | 92 |
| Nov. | 3 | 21,312 | 23 |
| " | 10 | 6,799 | 26 |
| " | 17 | 14,085 | 75 |
| " | 25 | 11,673 | 89 |
| Dec. | 1 | 8,039 | 03 |
| " | 8 | 5,551 | 15 |
| " | 15 | 5,880 | 19 |
| " | 22 | 5,474 | 07 |
| " | 29 | 4,445 | 86 |
| " | 31 | 2,134 | 11 |
| Total | | $800,219 | 44 |

## SCHEDULE No. 7.

### AQUEDUCT REPAIRS AND IMPROVEMENTS.

| | |
|---|---|
| Appropriation by the Common Council, for the year 1859 | $25,000 00 |
| Unexpended balance from 1858 | 295 63 |
| Total | $25,295 63 |

### DISBURSEMENTS.

| | |
|---|---|
| Analyses of Croton Water | $1,000 00 |
| Blacksmith Work | 34 85 |
| Cartage | 1,375 83 |
| Fencing | 887 49 |
| Hardware | 89 01 |
| Horse-hire | 467 04 |
| Iron Work | 58 00 |
| Labor | 6,144 30 |
| Lime, Cement and Sand | 76 50 |
| Lumber | 605 73 |
| Oil | 65 25 |
| Paint | 98 61 |
| Plumbing | 6 50 |
| Powder | 14 38 |
| Reservoir—Receiving | 96 00 |
| Seed | 18 77 |
| Stone and Brick | 164 68 |
| Sundry Bills | 591 52 |
| Taxes | 1,262 90 |
| Tools and Repairing | 33 86 |
| Carried forward | $13,091 22 |

| | |
|---|---|
| Brought forward | $13,091 22 |
| SUPERINTENDENTS' PAY, AS FOLLOWS: | |
| Daniel Adamson | 700 00 |
| James Scott | 650 00 |
| Barney See | 575 00 |
| James Bremner | 575 00 |
| James Berwick | 575 00 |
| John L. Berrian | 575 00 |
| Jacob Moore | 575 00 |
| Ralph Ellis | 730 00 |
| Unexpended Balance | 7,249 41 |
| Total | $25,295 63 |

## SCHEDULE No. 8.

### CROTON WATER WORKS EXTENSION.

| | |
|---|---|
| Appropriation by the Common Council for the year 1859 | $979,000 00 |

### DISBURSEMENTS.

| | |
|---|---|
| Croton Valley Surveys | $2,258 17 |
| Miscellaneous Bills, General | 49 25 |
| " " Engineers | 497 20 |
| New Reservoir, Contract for | 320,669 84 |
| " Contract for Sewer, for | 10,062 18 |
| " Engineers | 7,552 43 |
| " Inspectors | 12,353 25 |
| Stationery | 45 34 |
| Unexpended balance | 625,512 34 |
| Total | $979,000 00 |

## SCHEDULE No. 9.

### WATER PIPES AND LAYING.

| | | |
|---|---|---|
| Appropriation by the Common Council for the year 1859 | $94,300 | 00 |
| Unexpended balance from 1858 | 3,261 | 41 |
| Total | $97,561 | 41 |

### DISBURSEMENTS.

| | | |
|---|---|---|
| Advertising | $332 | 29 |
| Blasting | 481 | 00 |
| Brass cocks | 1,059 | 94 |
| Cartage | 520 | 22 |
| Casualties | 1,418 | 11 |
| Fire hydrants | 1,478 | 00 |
| Do. repairing | 783 | 01 |
| Fuel | 212 | 50 |
| Hydrant and stop-cock boxes | 1,985 | 21 |
| Iron pipes | 14,943 | 60 |
| Lead | 2,496 | 41 |
| Miscellaneous bills | 720 | 71 |
| Office expenses | 955 | 29 |
| Oil | 178 | 85 |
| Postage | 38 | 22 |
| Proving yard | 121 | 68 |
| Public hydrants | 864 | 66 |
| Repairing fountains | 323 | 16 |
| Repaving streets | 82 | 64 |
| Reservoir distributing | 4,259 | 96 |
| Carried forward | $33,255 | 46 |

| | |
|---|---|
| Brought forward | $33,255 46 |
| Small castings | 3,172 30 |
| Stationery | 793 08 |
| Stop-stocks | 10,640 00 |
| Stop-cocks, repairing | 424 97 |
| Tapping pipes | 1,406 50 |
| Tapper's boxes | 243 75 |
| Tools, and repairing | 1,122 49 |
| Wages | 39,852 70 |
| Wagon-hire | 427 71 |
| Water meters | 924 25 |
| Yarn | 188 80 |
| Unexpended balance | 5,109 40 |
| Total | $97,561 41 |

## SCHEDULE No. 10.

### SEWERS—REPAIRING AND CLEANING.

| | |
|---|---|
| Appropriation by the Common Council for the year 1859 | $20,500 00 |
| Unexpended balance from 1858 | 10,581 65 |
| | $31,081 65 |

### DISBURSEMENTS.

| | |
|---|---|
| Building new basins | $350 31 |
| Cartage | 8,178 43 |
| Casualties | 150 62 |
| Dumping sewer dirt | 48 84 |
| Man-hole and culvert covers | 2,205 98 |
| Repairing basins and culverts | 1,079 04 |
| " man-holes | 3,434 89 |
| " sewers | 618 57 |
| Rebuilding sewer in Twentieth street | 2,836 51 |
| Sundry bills | 2 40 |
| Tools and repairing | 113 53 |
| Workmen's wages | 12,061 88 |
| Unexpended balance | 65 |
| | $31,081 65 |

## SCHEDULE No. 11.

### STREET—EXPENSES AND PAVING.

| | |
|---|---|
| Appropriation by the Common Council for the year 1859 | $75,000 00 |
| Unexpended balance from 1858 | 4,143 28 |
| | $79,143 28 |

### DISBURSEMENTS.

| | |
|---|---|
| Bridge stone | $2,439 75 |
| Cartage | 14,432 57 |
| Laying new crosswalks | 55 30 |
| Miscellaneous bills | 1,488 85 |
| Paving stones | 4,127 37 |
| Printing and stationery | 18 00 |
| Sand | 4,635 49 |
| Tools and repairing | 936 57 |
| Wagon hire | 225 00 |
| Workmen's wages | 48,879 26 |
| Yard expenses | 60 95 |
| Unexpended balance | 1,844 17 |
| | $79,143 28 |

## SCHEDULE No. 12.

### WELLS AND PUMPS AND REPAIRING.

| | |
|---|---|
| Appropriation by the Common Council for the year 1859 | $4,000 00 |

### DISBURSEMENTS.

| | |
|---|---|
| Carpenter work | 752 26 |
| Cleaning and repairing wells | 314 65 |
| Labor | 270 63 |
| Mason work | 61 03 |
| New pumps | 1,031 00 |
| Repairing pumps | 794 95 |
| Unexpended balance | 775 48 |
| | $4,000 00 |

## SCHEDULE 13.

### STATISTICAL TABLES.

| | |
|---|---|
| Balance on hand from former appropriations, as per report for 1858 | $1,086 11 |

### DISBURSEMENTS.

| | |
|---|---|
| Chas. W. Baker, binding 25 volumes of the annual reports of the department | 27 50 |
| John J. Serrell, making map of sewers | 750 00 |
| Balance in Mechanics' Bank | 308 61 |
| | $1,086 11 |

## SCHEDULE No. 14.

### SALARIES.

| | | |
|---|---|---|
| Myndert Van Schaick, President............ | $2,000 | 00 |
| Theodore R. De Forest, Commissioner....... | 1,833 | 33 |
| Thomas B. Tappen, " " ....... | 1,166 | 67 |
| Alfred W. Craven, Engineer... ............ | 5,000 | 00 |
| John C. Winder, Assistant Engineer........ | 1,450 | 00 |
| John P. Flender, Water Purveyor........... | 1,125 | 00 |
| Aaron B. Rollins, " " ........... | 375 | 00 |
| Revo C. Hance, Water Registrar........... | 1,500 | 00 |
| William Fardon, Assistant Water Registrar.. | 1,000 | 00 |
| Henry L. Robertson, Clerk to the Board..... | 1,400 | 00 |
| Alexander F. Dodge, Contract Clerk........ | 1,200 | 00 |
| William V. Lecount, Clerk to Registrar..... | 1,000 | 00 |
| Jacob E. Howard " " .... | 1,000 | 00 |
| Edmund E. Dean " " .... | 666 | 66 |
| Gilbert A. White " " .... | 1,000 | 00 |
| Seymour V. Moody " " .... | 1,000 | 00 |
| Charles R. Fleet " " .... | 1,000 | 00 |
| John B. McKean " " .... | 283 | 34 |
| Peter D. De Forest, Clerk to Water Purveyor | 1,000 | 00 |
| James Reed " " " | 202 | 29 |
| John J. Conklin, Messenger................ | 700 | 00 |
| William H. Conklin, do. Engineer's Office | 360 | 00 |
| Myndert Van Schaick, as Accountant........ | 700 | 00 |
| | $26,962 | 29 |

## SCHEDULE No. 15.

### RUSS PAVEMENT IMPROVEMENT.

| | |
|---|---|
| Unexpended balance of Appropriation from the year 1858........................ | $26,000 00 |

### DISBURSEMENTS.

| | |
|---|---|
| John Martin for Labor, Tools, &c., on Broadway, between Reade and Duane streets... | 757 45 |
| Unexpended balance .................... | 25,242 55 |
| | $26,000 00 |

## SCHEDULE No. 16,

### EXHIBITING THE LEDGER BALANCE, DECEMBER 31, 1859.

| HEADS OF ACCOUNTS. | DR. | CR. |
|---|---|---|
| Aqueduct Repairs and Improvements | $18,046 22 | $25,295 63 |
| Croton Water-works Extension | 353,487 66 | 979,000 00 |
| Water Pipes and Laying | 92,452 01 | 97,561 41 |
| Sewers Repairing and Cleaning | 31,081 00 | 31,081 65 |
| Street Expenses and Paving | 77,299 11 | 79,143 28 |
| Wells and Pumps and Repairing | 3,224 52 | 4,000 00 |
| Russ Pavement Improvement | 757 45 | 26,000 00 |
| Statistical Tables | 777 50 | 1,086 11 |
| Salaries | 26,962 29 | 26,962 29 |
| Water Rents |  | 748,930 62 |
| Water Rents, Penalties thereon |  | 10,319 83 |
| Permits to connect with Sewers |  | 21,723 00 |
| Permits to construct Vaults |  | 17,616 74 |
| Petty Cash |  | 1,629 25 |
| City Chamberlain | 800,219 44 |  |
| Unexpended balances | 666,042 61 |  |
|  | $2,070,349 81 | $2,070,349 81 |

## SCHEDULE No. 17.

*The following table exhibits the yearly revenue derived from Croton Water, as collected by the Department, from its introduction into the city in* 1842, *with the annual increase or decrease thereof:*

| TIME. | RECEIPTS. | INCREASE. | DECREASE. |
|---|---|---|---|
| Oct. 5, '42 to May 1, '43 | $32,053 74 | .......... | —— |
| May 1, '43 " 1, '44 | 84,444 68 | $52,390 94 | —— |
| " 1, '44 " 1, '45 | 117,277 86 | 32,833 18 | —— |
| " 1, '45 " 1, '46 | 163,900 52 | 46,622 66 | —— |
| " 1, '46 " 1, '47 | 193,346 24 | 29,445 72 | —— |
| " 1, '47 " 1, '48 | 219,416 72 | 26,070 48 | —— |
| " 1, '48 " 1, '49 | 250,081 51 | 30,664 79 | —— |
| " 1, '49 to Dec.31, '49 | 259,532 97 | *9,451 46 | —— |
| Jan. 1, '50 " 31, '50 | 458,951 87 | †199,418 90 | —— |
| " 1, '51 " 31, '51 | 458,789 78 | .......... | $162 09‡ |
| " 1, '52 " 31, '52 | 533,965 16 | 75,175 38 | —— |
| " 1, '53 " 31, '53 | 579,956 30 | 45,991 14 | —— |
| " 1, '54 " 31, '54 | 608,966 15 | 29,009 85 | —— |
| " 1, '55 " 31, '55 | 674,736 42 | 65,770 27 | —— |
| " 1, '56 " 31, '56 | 662,949 57 | .......... | 11,786 85 |
| " 1, '57 " 31, '57 | 697,370 51 | 34,420 94 | —— |
| " 1, '58 " 31, '58 | 730,107 98 | 32,737 47 | —— |
| " 1, '59 " 31, '59 | 759,250 45 | 29,142 47 | —— |
| Total.......... | $7,485,098 43 | | |

---

* Eight months.

† Under the operation of the laws of 1849.

‡ A reduction in the rents, equal to about 10 per cent., was made this year.

## SCHEDULE No. 18.

*The following table exhibits the yearly revenue derived from permits to connec premises with the public sewers, as collected by this Department; also, the yearly expenditures for cleaning, repairing and rebuilding the sewers and their appurtenances:*

| TIME. | RECEIPTS. | EXPENDIT'RS. | EXCESS OF RECEIPTS. | EXCESS OF EXPENDIT'RS. |
|---|---|---|---|---|
| Feb. 5, 1846 to Dec. 31, 1846 | $4,852 50 | $4,404 17 | $448 33 | |
| Jan. 1, 1847 " 31, 1847 | 7,470 00 | 4,753 01 | 2,716 99 | |
| " 1, 1848 " 31, 1848 | 8,585 00 | 4,673 05 | 3,911 95 | |
| " 1, 1849 " 31, 1849 | 11,759 50 | 9,936 25 | 1,823 25 | |
| " 1, 1850 " 31, 1850 | 18,977 00 | 8,118 97 | 10,858 03 | |
| " 1, 1851 " 31, 1851 | 21,835 50 | 11,230 78 | 10,604 72 | |
| " 1, 1852 " 31, 1852 | 28,132 50 | 12,554 66 | 15,577 84 | |
| " 1, 1853 " 31, 1853 | 29,353 00 | 14,262 05 | 15,090 95 | |
| " 1, 1854 " 31, 1854 | 26,247 00 | 12,402 51 | 13,844 49 | |
| " 1, 1855 " 31, 1855 | 27,251 20 | 16,179 45 | 11,071 75 | |
| " 1, 1856 " 31, 1856 | 24,122 00 | 20,765 94 | 3,356 06 | |
| " 1, 1857 " 31, 1857 | 21,425 50 | 19,827 94 | 1,597 56 | |
| " 1, 1858 " 31, 1858 | 18,561 50 | 24,418 35 | ........... | $5,856 85 |
| " 1, 1859 " 31, 1859 | 21,723 00 | 31,081 00 | ........... | 9,358 00 |
| | $270,295 20 | $194,608 13 | $90,901 92 | $15,214 85 |

Total excess of receipts over expenditures......................$75,687 07

# SCHEDULE 19,

Of the locality, length, and size of all sewers, for which contracts have been made during the year 1859; together with the number of receiving basins attached to each, or separately constructed.

| LOCATION. | BETWEEN | LENGTH. | SIZE. | BASINS. |
|---|---|---|---|---|
| Forty-first street.. | Madison and Fifth avenues........... | 465 | 4 by 2 ft. 8 in. | 1 |
| East Broadway... | Pike and Rutgers streets............ | 620 | “ | |
| Seventh avenue.. | Fifty-sixth and Fifty-eighth sts....... | 495 | “ | 4 |
| Front street...... | Old slip and Gouverneur lane...... . | 301 | “ | |
| Ludlow street.... | Rivington and Delancey sts.......... | 326 | “ | |
| Greenwich street. | Perry and Charles sts.............. | 225 | “ | |
| Washington st.... | Cortlandt and Liberty sts............ | 236 | “ | |
| Henry st........ | Pike and Birmingham.............. | 282 | “ | |
| Thirty-sixth st... | Seventh avenue and Broadway....... | 524 | “ | |
| Fifty-fourth st.... | Second avenue and East river........ | 1415 | “ | 2 |
| East Broadway... | Gouverneur and Grand sts......... | 1000 | “ | 1 |
| Grand st........ | East Broadway and Columbia st.... | | | |
| Columbia st...... | Grand and Broome sts............ | | | |
| Seventeenth st... | Eighth and Ninth avenues......... | 1084 | “ | 2 |
| Ninth avenue..... | Sixteenth and Seventeenth sts...... | | | |
| Fiftieth st....... | Second and Third avenues.......... | 600 | “ | |
| Downing st....... | Bedford and Varick sts............. | 371 | “ | |
| Fifty-first st..... | Ninth avenue and 350 feet east....... | 303 | “ | |
| Twenty-fourth st. | Eighth and Tenth avenues........... | 1095 | “ | 1 |
| Washington st... | Cedar and Albany sts.. .......... | 163 | “ | |
| Eighty-sixth st... | Third avenue and East river....... | 4738 | “ | 12 |
| Third avenue..... | Eighty-fourth and Eighty-sixth sts.. | | | |
| Eighty-fifth st.... | Third and Fourth avenues......... | | | |
| Forty-seventh st.. | Seventh av. and 175 ft. w. of B'dway.. | 355 | “ | 1 |
| Essex st......... | Division to No. 10.............. | 207 | “ | |
| Eighth av.. .... . | Fifteenth and Sixteenth sts........... | 221 | “ | |
| Forty-ninth st.... | Eleventh avenue and Hudson river.... | 825 | “ | |
| Tenth avenue.... | Forty-sixth st. and 100 feet north..... | 153 | “ | |
| Thirty-fourth st.. | Hudson river and 275 ft. east 10th av.. | 2170 | “ | 5 |
| Ludlow st....... | Hester and Canal sts............... | 336 | “ | |
| Seventh avenue... | Forty-first and Forty-second sts...... | 189 | “ | |
| Forsyth street.... | Grand and Broome sts ............ | 278 | “ | |
| Fifty-third st..... | Third av. and 100 ft. west Fourth av | 1605 | “ | 3 |
| Lexington avenue | Fifty-second and Fifty-fourth sts.... | | | |
| Attorney st...... | Houston and Stanton sts............ | 375 | “ | |
| East Broadway... | Market and Pike sts................ | 590 | “ | |
| Sixty-first street.. | Second and Third avenues........... | 590 | “ | |
| 120th st......... | Third avenue and East river......... | 2850 | “ | 10 |
| Carried forward | .............................. | 24,987 | ................ | .... |

| LOCATION. | BETWEEN | LENGTH. | SIZE. | BASINS. |
|---|---|---|---|---|
| Brought forw'd | | 24987 | 4 by 2 ft. 8 in. | .... |
| Fiftieth st | Sixth and Seventh avenues | 855 | " | 1 |
| Columbia st | Delancey and Broome sts | 333 | " | |
| Forty-fifth st | Third and Lexington avenues | 392 | " | |
| Water st | Peck slip and Beekman st | 326 | " | |
| Sixth avenue | Forty-ninth and Fiftieth sts | 266 | " | 1 |
| Fifty-second st | Lexington and 400 ft. west Fourth av. | 1035 | " | 3 |
| Seventh avenue | Fifty-first and Fifty-fourth sts | 667 | " | 4 |
| Grand st | Essex and Allen sts | 607 | " | 6 |
| Reade st | West Broadway and Broadway | 856 | " | 3 |
| Do | Greenwich st. and West Broadway | 528 | " | |
| Sixteenth st | Avenue B and East river | 1665 | 5 by 3 ft. | 8 |
| Eighty-fourth st | Third and Fourth avenues | 962 | 4 by 2 ft. 8 in. | 1 |
| Ridge st | Grand and Broome sts | 257 | " | |
| Thirty-first st | Madison and Lexington avenues | 1101 | " | |
| Thirty-third st | First and Second avenues | | | |
| Allen st | Canal and 100 feet north of Division | 182 | " | |
| Ridge st | Broome and Delancey sts | 316 | " | |
| Water st | Old slip and Coenties slip | 418 | " | 1 |
| Essex st | Stanton and Houston | 374 | " | |
| Commerce st | Bedford and 50 ft. north of Bleecker st. | 375 | " | |
| Madison avenue | Thirty-eighth and Thirty-ninth sts | 192 | " | |
| Seventh avenue | Twenty-ninth and Thirtieth sts | 198 | " | |
| East Broadway | Catharine and Market sts | 710 | " | |
| Greenwich st | Barrow and Christopher sts | 319 | " | |
| Do | Vestry and Desbrosses sts | 193 | " | |
| Hudson st | Jane and Horatio sts | 190 | " | |
| Tenth st | Avenue D and Dry Dock st | 295 | " | 2 |
| Fourth st | Bank and Hammond sts | 133 | " | |
| Suffolk st | Houston and Stanton sts | 330 | " | |
| | RECEIVING BASINS. | | | |
| North-west corner | Thirty-fourth street and First avenue | | | 1 |
| South-east do | Burling slip and Front street | | | 1 |
| South-west do | Coenties slip and South st | | | 1 |
| North-west do | Avenue C and Fifteenth st | | | 1 |
| South-east do | Eleventh avenue and Forty-second st | | | 1 |
| North-east do | Do. do. | | | 1 |
| South-east do | Duane and City Hall place | | | 1 |
| South-west do | Do. Chatham st | | | 1 |
| South-east do | Broadway and Thirtieth st | | | 1 |
| North-east do | Do. do. | | | 1 |
| South-west do | Eighth avenue and Forty-fifth street | | | 1 |
| North-west do | Do. do. | | | 1 |
| North-east do | Do. and Thirty-fourth st | | | |
| Total length of Sewers by contract | | 39,062 | feet. | |
| Total number of Receiving Basins | | | | 84 |

**The following Sewers have been built at private expense, under the supervision of the Board:**

| LOCATION. | BETWEEN | LENGTH. | SIZE. | BASINS. |
|---|---|---|---|---|
| Fiftieth st........ | Second and First avenues............ | 640 | 4 by 2 ft. 8 in. | |
| Seventeenth st... | Tenth avenue and Hudson river...... | 996 | " | 2 |
| Forty-second st.. | Fifth and Sixth avenues.............. | 923 | " | |
| Duane st........ | Elm street and 210 feet east... ...... | 210 | " | |
| Allen st......... | Canal and Division streets........... | 36 | " | |
| And at the intersection of Avenue D and Fifteenth street four receiving basins............. ........... | | ...... | ............... | 4 |
| Total, at private expense...................... | | 2805 | | 6 |

## RECAPITULATION.

| | |
|---|---|
| Length of Sewers by contract.................................. | 39,062 feet. |
| Do. do. at private expense........................... | 2,805 " |
| Total.................................................. | 41,867 feet, |

or 7 miles, 4,907 feet.

Total number of Receiving Basins...................................90

## SCHEDULE No. 20.

### SEWERS,

*Constructed under the direction of the Croton Aqueduct Department, since its organization in* 1849.

| | | | |
|---|---|---|---|
| 1849. | Number of sewers | 25 | |
| | " basins and culverts | 58 | |
| | Lineal feet in length | | 16,165 |
| 1850. | Number of sewers | 70 | |
| | " basins and culverts | 173 | |
| | Lineal feet in length | | 61,579 |
| 1851. | Number of sewers | 105 | |
| | " basins and culverts | 157 | |
| | Lineal feet in length | | 63,009 |
| 1852. | Number of sewers | 100 | |
| | " basins and culverts | 196 | |
| | Lineal feet in length | | 65,689 |
| 1853. | Number of sewers | 85 | |
| | " basins and culverts | 256 | |
| | Lineal feet in length | | 73,542 |
| 1854. | Number of sewers | 88 | |
| | " basins and culverts | 244 | |
| | Lineal feet in length | | 73,519 |
| 1855. | Number of sewers | 65 | |
| | " basins and culverts | 110 | |
| | Lineal feet in length | | 38,679 |
| 1856, | Number of sewers | 73 | |
| | " basins and culverts | 121 | |
| | Lineal feet in length | | 49,280 |
| 1857. | Number of sewers | 23 | |
| | " basins and culverts | 19 | |
| | Lineal feet in length | | 10,430 |
| 1858. | Number of sewers | 56 | |
| | " basins and culverts | 98 | |
| | Lineal feet in length | | 36,258 |
| 1859. | Number of sewers | 64 | |
| | " basins and culverts | 90 | |
| | Lineal feet in length | | 41,867 |

Total—100 miles, 967 feet.

# SCHEDULE No. 21.

## NUMBER OF FEET OF WATER PIPES LAID, AND WHERE LAID, DURING THE YEAR EIGHTEEN HUNDRED AND FIFTY-NINE.

| STREET. | BETWEEN | 12 INCH. | 6 INCH. |
|---|---|---|---|
| Avenue A | Twenty-first and Twenty-fourth sts. | 740 | |
| First avenue | Thirty-sixth and Thirty-seventh sts. | 234 | |
| Second avenue | Forty-ninth and Fiftieth streets | 240 | |
| Do | Fifty-third and Fifty-fifth streets | 529 | |
| Do | Fifty-eighth and Fifty-ninth streets | 240 | |
| Fifth avenue | Fifty-fourth and Fifty-fifth streets | | 252 |
| Sixth avenue | Forty-fourth and Forty-sixth streets. | 520 | |
| Lexington avenue | Thirty-eighth and Forty-second sts. | | 1,040 |
| Sixteenth street | Tenth ave. to 432 feet westerly | | 432 |
| Twenty-second street | Tenth and Eleventh avenues | | 920 |
| Thirty-sixth street | East river to 400 ft. east Second av. | | 730 |
| Forty-fourth street | Eleventh avenue to 513 ft. easterly. | | 513 |
| Forty-sixth street | Second and Third avenues | | 800 |
| Do. | Fifth and Sixth avenues | | 635 |
| Fifty-third street | Sixth and Seventh avenues | | 900 |
| Fifty-fourth street | Do. do. | | 900 |
| Fifty-fifth street | Second avenue to 600 ft. easterly | | 600 |
| Do. | Fifth and Sixth avenues | | 810 |
| Fifty-seventh street | Seventh avenue and Broadway | | 628 |
| Fifty-ninth street | Eighth av. to 380 ft. west of Ninth av. | | 1,280 |
| Seventy-ninth street | Fourth and Fifth avenues | | 300 |
| One hundred and ninth street | Third avenue to 300 feet easterly | | 300 |
| One hundred and twelfth street | Third and Fourth avenues | | 818 |
| One hundred and seventeenth str't. | Third avenue to 300 feet easterly | | 300 |
| One hundred and eighteenth street | Third avenue to 400 feet easterly | | 400 |
| One hundred and twentieth street | Avenue A to 180 feet easterly | | 180 |
| One hundred and twenty-second st. | Third avenue to 288 feet westerly | | 288 |
| One hundred and twenty-third st. | Second and Third avenues | | 890 |
| Do. do. | Third avenue to 400 feet westerly | | 400 |
| One hundred and twenty-eighth st. | Third and Fourth avenues | | 910 |
| Broadway | Seventy-second and Seventy-fourth. | 505 | |
| Stanton street | Mangin street to East river | | 507 |
| | | 3,008 | 15,733 |

# SCHEDULE No. 22.

*Pipe of all Sizes, for the Supply and Distribution of Croton Water, to December 31, 1859.*

| TIME. | 48. | 36. | 30. | 24. | 20. | 16. | 12. | 10. | 6. | 4. | TOTALS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prev's to July, 1849 | | 60,333 | 25,796 | 5,400 | 20,275 | 13,125 | 225,140 | 5,875 | 668,107 | | 1,024,051 feet, or 193 miles 5,011 feet. |
| July to Dec'r, 1849 | | | | | | 953 | 2,430 | | 9,402 | 7,451 | 20,236 " 3 " 4,396 " |
| Jan'y to Dec'r, 1850 | | 545 | 2,040 | | 4,860 | | 2,375 | | 30,539 | 969 | 41,328 " 7 " 4,368 " |
| " " 1851 | | | | | 2,720 | | 18,739 | | 42,817 | 923 | 65,199 " 12 " 1,839 " |
| " " 1852 | | | | | 3,650 | | 12,171 | | 47,714 | | 63,535 " 12 " 174 " |
| " " 1853 | 3,500 | | 5,125 | | | | 996 | | 24,161 | | 33,782 " 6 " 2,102 " |
| " " 1854 | 587 | | | | 1,765 | | 5,000 | | 23,223 | | 30,575 " 5 " 4,175 " |
| " " 1855 | | | 10,582 | | 1,492 | | 6,063 | | 18,784 | | 36,921 " 6 " 5,141 " |
| " " 1856 | | | 1,319 | | 102 | | 2,731 | | 25,702 | 129 | 29,983 " 5 " 3,583 " |
| " " 1857 | | | | | | | 3,089 | | 20,131 | | 23,220 " 4 " 2,100 " |
| " " 1858 | | | | | 6,460 | 900 | 1,040 | | 11,150 | | 19,550 " 3 " 3,710 " |
| " " 1859 | | | | | | | 3,008 | | 15,733 | | 18,741 " 3 " 2,901 " |
| | 4,087 | 60,878 | 44,862 | 5,400 | 41,324 | 14,978 | 282,782 | 5,875 | 937,463 | 9,472 | 1,407,121 feet, or 266 miles 2,641 feet. |

**The present department was organized in July, 1849. The first line in the table gives the quantity in use at that time; the others the quantities laid each year since. The figures at the head of the columns indicate the internal diameter of the pipes in inches.**

## SCHEDULE No. 23.

### REPAVING RETURNS.

| STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| Avenue A | Twentieth to Twenty-fourth | 135 | 80 |
| Do. C | Houston and Fourteenth | 166 | 21 |
| First avenue | Houston to Nineteenth | 150 | 45 |
| Do. | Twenty-first to Thirty-first | 645 | 257 |
| Do. | Thirty-sixth to Thirty-seventh | 31 | 11 |
| Second avenue | Fourth to Thirty-third | 567 | 214 |
| Do. | Thirty-fourth to Forty-second | 155 | 97 |
| Third avenue | Sixth to Thirty-eighth | 764 | 202 |
| Fourth do | Seventeenth to Thirty-second. | 340 | 223 |
| Fifth do | Thirty-first to Thirty-second | 66 | 4 |
| Do. | Thirty-seventh to Thirty-ninth | 21 | 6 |
| Seventh avenue | Twelfth to Fourteenth | 24 | 18 |
| Do. | Seventeenth to Forty-fourth | 404 | 244 |
| Eighth avenue | Abingdon sq. to Thirtieth st. | 657 | 106 |
| Ninth do | Fifteenth to Thirty-fourth | 957 | 83 |
| Tenth do | Fourteenth to Twenty-sixth | 510 | 19 |
| Eleventh do | Forty-second to Forty-third | 4 | 5 |
| Lexington do | Twentieth to Thirty-third | 376 | 80 |
| Second street | Avenue D and Bowery | 582 | 192 |
| Fourth | Avenues B and C | 10 | 4 |
| Do. | First and Fourth avenues | 55 | 16 |
| Do. | Thirteenth and Horatio streets | 12 | 3 |
| Third street | First and Second avenues | 31 | 10 |
| Third | Avenue D and Manhattan st. | 8 | 3 |
| Fifth | Lewis street and Bowery | 150 | 67 |
| Eighth | Lewis street and Avenue C | 24 | 6 |
| Do. | Broadway and Sixth avenue | 168 | 44 |
| Ninth | Third and Sixth avenues | 146 | 27 |
| Tenth | East river and Avenue C | 81 | 14 |
| Do | Second and Fourth avenues | 24 | 2 |
| Thirteenth | Fifth and Sixth avenues | 64 | 12 |
| Do. | Seventh and Ninth avenues | 77 | 21 |
| Fourteenth | Fourth and Seventh avenues. | 36 | 21 |
| Do. | Ninth and Tenth avenues | 29 | 26 |
| Seventeenth | First and Fourth avenues | 78 | 14 |
| Nineteenth | Sixth and Seventh avenues | 15 | |
| Twentieth | Avenue A and Broadway | 172 | 75 |
| Do. | Tenth and Eleventh avenues | 6 | 1 |
| Twenty-first | First and Third avenues | 92 | 32 |
| Twenty-second | Avenue A and Third avenue. | 245 | 78 |
| Twenty-third | First avenue and Lexington | 295 | 104 |

| STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| Twenty-third | Madison avenue and Broadway | 13 | 10 |
| Twenty-fourth | East river and Second avenue. | 48 | 6 |
| Twenty-fifth | Madison and Third avenues | 54 | 14 |
| Do. | Sixth avenue and Broadway | 50 | 17 |
| Twenty-sixth | Third avenue and do | 125 | 16 |
| Do. | Sixth and Tenth avenues | 79 | 58 |
| Twenty-seventh | Broadway and Eleventh av. | 205 | 57 |
| Twenty-eighth | do. do. | 292 | 57 |
| Twenty-ninth | Second and Third avenues | 62 | 26 |
| Do. | Eighth and Tenth avenues | 225 | 58 |
| Thirtieth | Eighth and Ninth avenues | 188 | 51 |
| Thirty-second | Third to Fifth avenue | 94 | 39 |
| Do. | Ninth to Tenth avenue | 38 | 8 |
| Thirty-third | Fifth avenue and Broadway | 27 | 12 |
| Thirty-fourth | First and Third avenues | 189 | 117 |
| Thirty-fifth | do. do. | 130 | 52 |
| Do. | Ninth and Eleventh avenues | 189 | 44 |
| Thirty-sixth | First and Third avenues | 115 | 56 |
| Thirty-seventh | Second and Third avenues | 30 | 67 |
| Do. | Fifth and Madison avenues | 52 | 17 |
| Thirty-eighth | Second and Third avenues | 82 | 29 |
| Do. | Fifth and Madison avenues | 106 | 41 |
| Fortieth | Madison and Third avenues | 70 | 26 |
| Forty-second | Eighth and Tenth avenues | 241 | 122 |
| Forty-third | do. do. | 61 | 18 |
| Forty-fourth | Broadway and Ninth avenue. | 36 | 127 |
| Do. | Tenth and Eleventh avenues | 42 | 35 |
| Forty-sixth | do. do. | 26 | 50 |
| Forty-seventh | Broadway and Twelfth avenue | 131 | 93 |
| Forty-ninth | Eighth and Ninth avenues | 5 | 24 |
| Fiftieth | Broadway and Eighth avenue. |  | 45 |
| Albany | Greenwich and West streets | 59 | 11 |
| Allen | Broome and Rivington | 12 | 5 |
| Amity | Sixth avenue and Broadway | 180 | 13 |
| Ann | Broadway and Gold street | 20 | 3 |
| Attorney | Broome and Rivington | 14 | 9 |
| Bank | West and Greenwich avenue | 26 | 30 |
| Barclay | West and West Broadway | 230 | 40 |
| Baxter | Canal and Grand | 23 | 11 |
| Beach | Hudson and West Broadway. | 30 | 16 |
| Beaver | Pearl and Broadway | 146 | 22 |
| Beekman | Nassau and South | 150 | 23 |
| Bleecker | Bowery and Bank | 246 | 54 |
| Bridge | Whitehall and Broad | 14 |  |
| Broad | South and Exchange place. | 164 | 27 |

| STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| Broadway | Seventeenth to Forty-fourth | 728 | 256 |
| Broome street | Broadway and Centre | 25 | 14 |
| Do. | Eldridge and Tompkins | 52 | 25 |
| Burling slip | Pearl and South | 301 | 86 |
| Cannon street | Broome and Rivington | 11 | 7 |
| Carlisle | Greenwich and West | 26 | |
| Cedar | West and Broadway | 37 | 10 |
| Chambers | Broadway and Centre | 37 | 8 |
| Do. | West and Church | 190 | 49 |
| Cherry | East and Corlears | 16 | 144 |
| Do. | Dover and Rutgers | 108 | 80 |
| Christopher | Greenwich avenue and Hudson | 53 | 12 |
| Church | Duane and Reade | 78 | 24 |
| Clark | Broome and Spring | 9 | 3 |
| Clinton | Broome and Rivington | 12 | 8 |
| Coenties slip | Pearl and South | 316 | 45 |
| Crosby | Bleecker and Houston | 12 | 3 |
| Delancey | Bowery and Tompkins | 77 | 38 |
| Desbrosses | West and Hudson | 47 | 18 |
| Division | Essex and Suffolk | 20 | 15 |
| Do. | Catharine and Forsyth | 38 | 15 |
| Duane | Rose and Chatham | 30 | 13 |
| Do. | Broadway and Greenwich | 11 | 2 |
| Do. | Washington and West | 10 | 2 |
| Dutch | Fulton and John | 3 | 3 |
| East | Corlears and Grand | 10 | 4 |
| East Broadway | Chatham and Scammel | 209 | 37 |
| Elizabeth street | Bayard and Canal | 24 | 10 |
| Eldridge | Broome and Rivington | 12 | 2 |
| Essex | Hester and Houston | 95 | 30 |
| Exchange place | William and Broadway | 28 | 3 |
| Forsyth | Bayard and Grand | 22 | 20 |
| Do. | Broome and Rivington | 21 | 8 |
| Franklin | Broadway and Varick | 92 | 26 |
| Front | Whitehall and Jackson | 654 | 118 |
| Gansevoort | Hudson and Fourth | 26 | 7 |
| Gay | Waverley pl. and Christopher | | |
| Greene | Waverley pl. and Eighth st. | 15 | 1 |
| Greenwich | Battery place and Liberty | 141 | 10 |
| Do. | Barclay and Murray | 25 | |
| Do. | Desbrosses and Vestry | 36 | 6 |
| Goerck | Broome and Rivington | 11 | 6 |
| Gold | John and Beekman | 19 | 3 |
| Grove | Hudson and Waverley place | 70 | 8 |
| Hammond | Waverley place and Fourth st | 1 | |

| STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| Hester | Elizabeth and Centre | 41 | 28 |
| Hoboken | West and Canal | 17 | 2 |
| Houston | Hudson river to East river | 419 | 161 |
| Howard | Broadway and Elm | 10 | 3 |
| Hudson | Canal to int. Ninth avenue | 810 | 190 |
| Do. | Thirteenth to Fourteenth | 15 | 1 |
| Jackson | Grand and Front | 20 | 19 |
| James | Chatham and Cherry | 27 | 9 |
| James' slip | Water and Cherry | 12 | 5 |
| Jefferson street | Water and East Broadway | 70 | 26 |
| John | Broadway and Pearl | 74 | 25 |
| Laight | Washington and Varick | 75 | 39 |
| Laurens | Broome and Spring | 23 | 1 |
| Lewis | Grand and Eighth | 187 | 74 |
| Liberty | West to Broadway | 145 | 64 |
| Ludlow | Broome and Rivington | 11 | 6 |
| Madison square | Broadway and Fourth avenue. | 124 | 61 |
| Maiden lane | Broadway and South | 217 | 23 |
| Mangin | Broome and Rivington | 10 | 7 |
| Market | Cherry and Henry | 75 | 40 |
| Morris | West and Greenwich | 25 | 18 |
| Mulberry | Spring and Prince | 13 | 5 |
| Murray | Broadway and West | 268 | 89 |
| Nassau | Liberty and Spruce | 79 | 21 |
| Do. | Cedar and Wall | 56 | 18 |
| New | Exchange place and Beaver | 17 | 4 |
| North Moore | Hudson and West Broadway. | 34 | 22 |
| Norfolk | Grand and Rivington | 38 | 12 |
| Orchard | Broome and Rivington | 9 | 6 |
| Old slip | Water and Pearl | 72 | 12 |
| Pearl street | Broad and Pine | 169 | 23 |
| Do. | Platt and Beekman | 50 | 12 |
| Peck slip | Pearl and South | 154 | 50 |
| Perry street | West and Hudson | 44 | 12 |
| Pitt | Broome and Stanton | 51 | 22 |
| Prince | Thompson and Laurens | 11 | 4 |
| Rose | Pearl and Frankfort | 30 | 7 |
| Rector | West and Washington | 15 | 14 |
| Do. | Temple and Greenwich | 40 | 11 |
| Ridge | Broome and Stanton | 38 | 20 |
| Rivington | Goerck and Essex | 70 | 37 |
| Robinson | West and Washington | 33 | 11 |
| Roosevelt | Front and Chatham | 25 | 6 |
| Sheriff | Broome and Rivington | 11 | 6 |
| South | Whitehall to Roosevelt | 760 | 298 |

| STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| South William | Pearl and Beaver | 17 | 5 |
| Spring | Broadway and West | 340 | 92 |
| Stanton | Tompkins and Mangin | 4 | 4 |
| State | Whitehall and Pearl | 35 | 5 |
| Stone | Broad and Whitehall | 12 | |
| Stuyvesant | Second and Third avenues | 52 | 17 |
| Suffolk | Division and Rivington | 20 | 12 |
| Sullivan | Broome and Spring | 8 | 2 |
| Thompson | Canal and Spring | 32 | 17 |
| Tompkins | Rivington and Grand | 12 | 8 |
| Varick | Franklin and Canal | 98 | 57 |
| Vestry | West and Hudson | 102 | 31 |
| Walker | Baxter and West Broadway | 52 | 34 |
| Wall | Broadway to Pearl | 206 | 6 |
| Do | Front to South | 128 | 21 |
| Warren | West Broadway and Church | 52 | 20 |
| Washington | Battery place and Chambers | 291 | 62 |
| Do. | Reade and Duane | 5 | 3 |
| Do. | Harrison and North Moore | 25 | 1 |
| Do. | Desbrosses and Laight | 48 | 17 |
| Water | Moore and Jackson | 527 | 120 |
| Watts | West and Canal | 40 | 13 |
| West | Battery place and Cedar | 301 | 61 |
| Do | Liberty and Fulton | 109 | 24 |
| Do | Barclay and Chambers | 150 | 29 |
| Do | Duane and Franklin | 70 | 17 |
| Do | Hoboken and Watts | 16 | 6 |
| White | Church and West Broadway | 31 | 9 |
| Willett | Broome and Stanton | 33 | 14 |
| William | Fulton and Beekman | 18 | 3 |
| Do. | John and Beaver | 73 | 13 |
| Wooster | Grand and Broome | 12 | 6 |
| | Total | 23,762 | 7,577 |

## SCHEDULE No. 24.

### CROSSWALK RETURNS.

| DATE. | LOCALITY. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| 1859. | | | |
| May 2d to 14. | Corner of Chatham and Centre......... | 14 | 3 |
| | “ White and Broadway ........ | 5 | 3 |
| | “ Seventh av. and Nineteenth st. | 20 | 11 |
| | “ “ Twentieth st.. | 22 | 11 |
| | “ Market st. and East Broadway. | 15 | 9 |
| | “ West and Spring ............ | 20 | 10 |
| May 16 to 28. | “ “ and Charlton .......... | 5 | 3 |
| | “ Wall and New.............. | 10 | |
| | “ “ and Nassau............ | 5 | |
| | “ Eighth av. and Twenty-fourth st | 10 | 5 |
| | “ “ “ .. | 10 | 5 |
| | “ Lewis and Rivington......... | 6 | 4 |
| | “ Pitt “ ........ | 6 | 5 |
| | “ Delancey and Sheriff......... | 4 | 3 |
| | “ Walker and West Broadway .. | 5 | 4 |
| | “ “ “ .. | 5 | 4 |
| | “ “ and Church.......... | 6 | 3 |
| | “ Murray and “ .......... | 5 | 4 |
| May 30th to June 11th. | “ Broadway and Walker ....... | 6 | 2 |
| | “ Delancey and Sheriff......... | 8 | 3 |
| | “ Seventh avenue and Twelfth st. | 38 | 29 |
| | “ “ “ Thirteenth. | 18 | 11 |
| | “ “ “ Twentieth. | 22 | 14 |
| | “ “ “ Nineteenth | 18 | 9 |
| June 13th to 25th. | “ Third avenue and Sixty-first st. | 4 | |
| | “ “ “ Forty-sec’d | 8 | 3 |
| | “ “ “ Fortieth .. | 18 | 6 |
| | “ Tenth av. and Twenty-third st. | 10 | 5 |
| | “ Sixth avenue and Eighth street. | 10 | 3 |
| | “ “ “ Amity street. | 5 | 2 |
| | “ Broome and Centre .......... | 13 | 9 |
| | “ “ Lewis........... | 15 | 9 |
| June 27th to July 9th. | “ Broadway and Eighteenth st... | 10 | 5 |
| | “ “ Nineteenth st... | 8 | 4 |
| | “ “ Twentieth street. | 11 | 7 |
| | “ “ Twenty-first st.. | 12 | 4 |
| | “ “ Lispenard street. | 6 | 2 |
| | “ “ Franklin street. | 7 | 3 |
| | “ Jackson and Water.......... | 10 | 6 |
| | “ Tenth avenue and Fortieth st.. | 6 | 4 |
| | “ Chambers and Church........ | 10 | 3 |

| DATE. | LOCALITY. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| 1859. | | | |
| June 27th | Corner of Warren and Church streets.... | 12 | 4 |
| to July 9th. | “ Murray “ ........ | 12 | 3 |
| | “ Jackson and Cherry ......... | 8 | 5 |
| July 11th | “ Spring and Mercer........... | 8 | 2 |
| to July 23d. | “ “ Greene........... | 6 | 4 |
| | “ “ Wooster ......... | 10 | 3 |
| | “ “ Laurens .......... | 5 | 5 |
| | “ “ Thompson ........ | 9 | 7 |
| | “ “ Sullivan .......... | 6 | 9 |
| | “ “ Macdougal ........ | 10 | 5 |
| | “ “ Clark ............ | 8 | 3 |
| | “ “ Varick........... | 12 | 8 |
| | “ Twentieth st. and Irving place. | 10 | 4 |
| | “ Wall and Exchange.......... | 8 | |
| | “ “ Front............. | 10 | 4 |
| | “ Hudson and Thomas......... | 12 | 8 |
| | “ “ Jay............ | 12 | 6 |
| | “ “ Worth.......... | 15 | 8 |
| | “ “ Leonard ........ | 10 | 6 |
| | “ “ Franklin ........ | 8 | 4 |
| | “ “ North Moore .... | 4 | 2 |
| | “ “ Hubert ......... | 15 | 10 |
| | “ “ Beach .......... | 8 | 5 |
| | “ “ Laight .......... | 6 | 4 |
| July 25th to | “ “ Vestry ......... | 5 | 3 |
| Aug. 6th. | “ “ Beach ......... | 10 | 8 |
| | “ Water and James' slip ....... | 6 | 4 |
| | “ Second av. and Thirty-sixth st. | 10 | |
| | “ First avenue and “ .. | 10 | |
| | “ Broome and Sullivan......... | 5 | 4 |
| | “ Downing and Varick......... | 10 | 5 |
| | “ Bleecker and Sullivan........ | 4 | 2 |
| | “ Houston and Varick ......... | 6 | 4 |
| | “ Bleecker and Thompson ...... | 4 | 3 |
| | “ “ Carmine........ | 5 | 4 |
| | “ “ Laurens........ | 4 | 2 |
| | “ “ Minetta ........ | 6 | 4 |
| | “ “ Wooster ....... | 4 | 3 |
| | “ “ Minetta ........ | 4 | 3 |
| | “ “ Greene......... | 5 | 2 |
| | “ “ Macdougal...... | 5 | 3 |
| | “ “ Mercer ........ | 4 | 3 |
| Aug. 8th | “ Bowery and Canal........... | 2 | |
| to 20th. | “ “ Hester.......... | 3 | |

| DATE. | LOCALITY. | LOADS SAND. | LOADS STONE. |
|---|---|---|---|
| 1859. | | | |
| Aug. 8th | Corner of Bowery and Grand street..... | 1 | |
| to 20th. | “ “ Broome......... | 1 | |
| | “ “ Delancey........ | 1 | |
| | “ “ Rivington....... | 1 | |
| | “ Second avenue and Second st.. | 10 | 5 |
| | “ “ Third...... | 8 | 6 |
| | “ “ Fourth.... | 10 | 5 |
| | “ “ Fifth...... | 12 | 6 |
| | “ “ Sixth..... | 15 | 10 |
| | “ “ Seventh... | 10 | 4 |
| | “ “ Eighth.... | 15 | |
| | “ Fourth street and Jones...... | 10 | 5 |
| Aug. 22d | “ Thompson and Houston...... | 8 | 4 |
| to Dec. 31st. | “ Laurens “ ...... | 6 | 5 |
| | “ Wooster “ ...... | 12 | 8 |
| | “ Clinton and Cherry.......... | 8 | 6 |
| | “ Catharine “ .......... | 4 | 3 |
| | “ First av. and Twenty-eighth st. | 6 | 2 |
| | “ Second avenue and Eighth st.. | 6 | |
| | “ Third avenue and “ .. | 6 | |
| | “ Second avenue and Tenth st... | 6 | 8 |
| | “ Ninth st. and Stuyvesant place. | 4 | 3 |
| | “ Canal and Broadway........ | 3 | 6 |
| | “ “ Mercer........... | 4 | 4 |
| | “ “ Greene.......... | 3 | 5 |
| | “ “ Church........... | 2 | 3 |
| | “ “ Wooster.......... | 5 | 4 |
| | “ “ Laurens.......... | 4 | 6 |
| | “ “ West Broadway.... | 6 | 2 |
| | “ Greenwich and Perry........ | 4 | 2 |
| | “ West “ ....... | 4 | 3 |
| | “ Third av. and Thirty-fourth st. | 10 | 3 |
| | opposite No. 61 West street........... | 6 | 4 |
| | corner of Eighth street and First avenue. | 10 | 6 |
| | “ “ “ Second av... | 10 | 10 |
| | “ “ “ Third avenue. | 6 | 6 |
| | opposite No. 41 West Twenty-first street. | 6 | |
| | Total........................ | 995 | 550 |

## SCHEDULE No. 25.

### WELLS FILLED IN DURING 1859.

Northwest corner Clinton and East Broadway.
Opposite No. 144 West Twentieth street.
Northeast corner Market and Madison streets.
Opposite No. 42 East Broadway.
Northwest corner Allen and Rivington streets.
Northeast “ Essex “ “
Opposite No. 233 Mulberry street.
Southwest corner Grand and Sheriff streets.
“ “ Bowery and Grand street.
Northeast “ Clinton and Rivington streets.
Southwest “ Beach and Varick streets.
Northwest “ Broadway and Amity streets.
“ “ Bayard and Chrystie streets.
Northeast “ 10th street and 6th avenue.
Northwest “ Hudson and Clarkson streets.
East side Eldridge st. 20 feet north Hester street.
Northwest corner Forsyth and Hester streets.
Opposite No. 245 Henry street.
“ “ 86 Bowery.
Southeast corner Rutger and Henry streets.
Madison st., 25 feet south of Montgomery st.
Southeast corner Mott and Houston streets.
Northwest “ Forsyth and Grand streets.
Southwest “ Elm and Grand streets.
Northwest “ 6th avenue and 11th street.
“ “ Houston and Crosby streets.
“ “ 12th st. and University place.
Northeast “ Columbia and Delancey streets.
Northwest “ 6th avenue and 25th streets.
Northside 2d st., between 1st and 2d avenues.
Opposite No. 137 Norfolk street.

## PUMPS REMOVED AND WELLS COVERED OVER DURING 1859.

Southwest corner Grand and Norfolk streets.
" " Grand and Eldridge streets.
Opposite No. 44 Delancey street.
Southeast corner Rivington and Ludlow streets.
Southwest " Rivington and Norfolk streets.
Opposite No. 95 West 49th street.
North side of 82d st., 20 feet east of 3d avenue.
Northwest corner 9th avenue and 21st st.
" " Bleecker and Laurens streets.
" " Hester and Elizabeth streets.
Northeast " Bowery and Stanton streets.
Southwest " Chrystie " "
Northeast " 3d avenue and 25th street.
Opposite No. 245 West 37th street.
Northwest corner Clinton and Stanton streets.
" " Ridge and Houston streets.
" " Laight aud Hudson streets.
Southwest corner Centre and Broome streets.
" " Attorney and Houston streets.
" " Avenue C and 2d street.
Opposite No. 230 2d street.
Southeast corner Ridge and Rivington streets.
" " Attorney " "
North side of 9th street, 100 feet west 1st avenue.
West side of Ridge st., 100 feet from Grand st.
Opposite No. 127 West 19th street.
Northeast corner Rivington st. and Bowery.
Northwest " Broadway and 48th street.
Opposite No. 125 Hammond street.
Northeast corner Christopher and Hudson streets.

North side Mott street, 40 feet from Grand street.
West side East Broadway, 75 feet from Pike street.
Opposite 107 Eldridge street.
Northeast corner Avenue B and 4th street.
Northwest “ Hester and Suffolk streets.
“ “ 3d avenue and 15th street.
“ “ Hammond street and Waverley place.

## SCHEDULE No. 26.

Being an abstract of all contracts which have been made during the year 1859, for the laying of Trap-block Pavement. Those marked (*) are uncompleted.

| STREET. | BETWEEN. | NUMBER OF SQUARE YARDS. | PROPORTION OF EXPENSE PAID BY CITY. |
|---|---|---|---|
| Thirth-ninth street.... | Second and Third Avenues................ | 2,087 | |
| Columbia street.....<br>Avenue D.......... | Grand and Eleventh streets................ | 16,498 | all |
| *Fifth Avenue........ | Washington Square and Forty-second street.. | 42,000 | 1-2 |
| Thirty-seventh street.. | Fifth and Sixth Avenues.................. | 2,871 | 1-2 |
| Forty-fourth street.... | Sixth Avenue and Broadway............... | 2,634 | 1-2 |
| *Sixth Avenue........ | Carmine and Forty-second streets.......... | †70,000 | 1-3 |
| Fifty-second street.... | Second and Third Avenues................ | 2,135 | 1-3 |
| Forty-ninth street..... | Third and Lexington Avenues.............. | 1,454 | 1-2 |
| Eighteenth-street...... | Broadway and Sixth Avenue............... | 4,538 | 1-2 |
| St. Mark's Place..... | First and Third Avenues.................. | 5,404 | 1-2 |
| Fifty-third street..... | Broadway and Eighth Avenue.............. | 1,942 | 1-2 |
| *Forty-sixth street.... | Fifth and Sixth Avenues.................. | 3,060 | 1-2 |
| Battery Place........ | Broadway and North River................ | 8,218 | 1-2 |
| Fifty-first street...... | Second and Fourth Avenues............... | 5,256 | |
| Forty-third street..... | Seventh and Eighth Avenues.............. | 2,727 | |
| *Twentieth street..... | Fifth and Sixth Avenues.................. | 2,734 | 1-2 |
| *Wall street.......... | Broadway and East River................. | 8,500 | 1-3 |
| Duane street......... | Chatham and City Hall Place.............. | 975 | 1-2 |
| *Forty-eighth street... | Sixth and Seventh Avenues............... | 2,720 | |
| | Total Square Yards........... | 185,753 | |

The following contracts for Trap-block Pavements have been awarded, and submitted to the Common Council for confirmation:

| STREET. | BETWEEN. | NUMBER OF SQUARE YARDS. | PROPORTION OF EXPENSE PAID BY CITY. |
|---|---|---|---|
| Thirty-sixth street.... | Fifth and Sixth Avenues.................. | 2,878 | 1-3 |
| Eighth Avenue ...... | Hudson and Forty-second street............ | †58,000 | 1-3 |
| Thirty-fourth street... | Fourth and Ninth Avenues................ | 27,700 | 1-2 |
| Forty-second street... | Sixth and Seventh Avenues............... | 3,474 | |
| Thirty-seventh street.. | Lexington and Fourth Avenues............ | 1,400 | |
| Fourth Avenue....... | Thirty-fourth and Thirty-eighth streets...... | 7,050 | |
| | Total Square Yards.......... | 100,502 | |

† NOTE.—These are the original estimates for the full width of the carriage-way. By subsequent action of the Common Council, the Board is directed to omit the pavement between the outside rail-tracks of the Sixth and Eighth Avenue Railroad Companies.

## COBBLE-STONE PAVEMENTS.

Contracts have been awarded for the construction of the following Cobble-stone Pavements:

| STREET. | BETWEEN. | NUMBER OF SQUARE YD'S. |
|---|---|---|
| Forty-third street | Eleventh Avenue and Hudson river | 2,400 |
| Forty-second street | Tenth Avenue and Hudson river | 10,340 |
| Thirty-eighth street | Third and Fourth Avenues | 2,573 |
| Mulberry street | Canal street and 200 feet south | 485 |
| Fiftieth street | Eighth and Ninth Avenues | 2,518 |
| Thirty-seventh street | Second and First Avenues | 2,000 |
| Forty-first street | Ninth and Tenth Avenues | 2,511 |
| Twenty-ninth street | First and Second Avenues | 1,950 |
| Forty-eighth street | Eleventh Avenue and Hudson river | 2,296 |
| Fifty-second street | Eighth and Ninth Avenues | 2,500 |
| Fifty-first street | Tenth and Eleventh Avenues | 2,460 |
| Fifty-first street | Eleventh and Twelfth Avenues | 2,530 |
| Forty-sixth street | Ninth Avenue and 60 feet east | 165 |
| | Total Square Yards | 34,728 |

## CROSS WALKS.

Contracts have been awarded for laying the following Cross Walks:

Second, Third and Fourth Avenues, from Seventy-ninth to Ninety-fifth streets.
South-east to South-west corner Bowery and Broome street.
One hundred twenty-first street, intersections of Avenues A, First, Second and Third.
One hundred twenty-seventh street, intersection of Fifth Avenue.

## MISCELLANEOUS CONTRACTS.

| | |
|---|---|
| 50 | Twelve inch Iron Stop Cocks. |
| 200 | Six inch " " |
| 1,500 | ⅝ inch Brass Stop Cocks. |
| 2,500 | Six inch Iron Pipes. |

# SCHEDULE No. 27.

*Appropriations for the Croton Aqueduct Department, from 1850 to 1859, inclusive.*

| YEAR. | Aqueduct Repairs and Impr'ments. | Aqueduct Construction. | Croton Waterworks Extension. | Water Pipes and laying. | Sewers Rep'ring and Cleaning. | Street Expenses and Paving. | Wells and Pumps. | S'atistical Tables. | Salaries. | Special Appropriations. | TOTAL AMOUNTS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850 | $22,656 22 | $21,124 87 | $36,278 21 | $154,531 24 | $10,194 75 | ............ | ............ | $3,314 35 | $22,478 42 | $3,523 03 | $274,101 09 |
| 1851 | 15,000 00 | ............ | ............ | 193,447 00 | 10,500 00 | ............ | ............ | 1,500 00 | 23,870 00 | 5,000 00 | 249,317 00 |
| 1852 | 35,000 00 | ............ | ............ | 156,110 00 | 12,500 00 | ............ | ............ | ............ | 25,049 66 | 8,383 26 | 237,042 92 |
| 1853 | 15,000 00 | 3,000 00 | 218,400 00 | 112,513 00 | 16,500 00 | ............ | ............ | 1,500 00 | 24,539 66 | ............ | 391,452 66 |
| 1854 | 52,000 00 | ............ | 10,500 00 | 123,000 00 | 15,500 00 | ............ | ............ | 1,500 00 | 25.439 00 | ............ | 227,939 00 |
| 1855 | 20,000 00 | 5,500 00 | 210,000 00 | 123,500 00 | 17,000 00 | ............ | ............ | 1,500 00 | 25,847 36 | ............ | 403,347 36 |
| 1856 | 20,000 00 | 5,000 00 | 108,000 00 | 105,700 00 | 24,000 00 | ............ | ............ | 1,500 00 | 21,267 51 | ............ | 285,467 51 |
| 1857 | 45,000 00 | ............ | 348,000 00 | 91,300 00 | 24,000 00 | 36,525 66 | ............ | ............ | 22,796 68 | ............ | 567,622 34 |
| 1858 | 20,000 00 | ............ | 708,000 00 | 116,630 00 | 35,000 00 | 90,000 00 | 1,700 00 | ............ | 26,810 00 | 26,000 00 | 1,024,140 00 |
| 1859 | 25,000 00 | ............ | 979,000 00 | 89,300 00 | 20,500 00 | 75,000 00 | 4,000 00 | ............ | 26,962 29 | ............ | 1,219,762 29 |
|  | $269,656 22 | $34,624 87 | $2,618,178 21 | $1,266,031 24 | $185.694 75 | $201,525 66 | $5,700 00 | $10,814 35 | $245.060 58 | $42,906 29 | $4.880,192 17 |

*Expenditures of the Croton Aqueduct Department, from 1850 to 1859, inclusive.*

| YEAR. | Aqueduct Repairs and Impr'ments. | Aqueduct Construction. | Croton Waterworks Extension. | Water Pipes and Laying. | Sewers Rep'ring and Cleaning. | Street Expenses and Paving. | Wells and Pumps. | Statistical Tables. | Salaries. | Special Appropriaticns. | TOTAL AMOUNTS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850 | $12,697 31 | $16,197 02 | $31,711 05 | $146,883 93 | $8,118 97 | ............ | ............ | $2,251 74 | $22,478 42 | $3,477 20 | $243,815 64 |
| 1851 | 23,688 53 | ............ | 2,955 74 | 187,498 12 | 11,230 78 | ............ | ............ | 1,071 20 | 23,870 00 | 4,427 46 | 254,741 83 |
| 1852 | 23,451 41 | 210 65 | 775 16 | 150,651 25 | 12,554 66 | ............ | ............ | 1,145 25 | 25,049 66 | 6,129 11 | 219,967 15 |
| 1853 | 14,980 67 | 2,000 00 | 147,071 43 | 102,992 71 | 14,262 05 | ............ | ............ | 745 00 | 24,539 66 | ............ | 306,591 52 |
| 1854 | 43,773 90 | ............ | 10,059 17 | 123,000 00 | 12,402 51 | ............ | ............ | 437 75 | 25,439 00 | ............ | 215,112 33 |
| 1855 | 19,994 55 | 500 00 | 169,825 27 | 119,719 24 | 16,179 45 | ............ | ............ | 2,814 30 | 25,847 36 | ............ | 354,380 17 |
| 1856 | 26,889 31 | ............ | 46,143 32 | 120,652 15 | 20,765 94 | ............ | ............ | 1,100 00 | 21,267 51 | ............ | 236,818 23 |
| 1857 | 44,620 72 | ............ | 18,645 66 | 91,293 27 | 19,227 94 | 36,525 66 | ............ | 582 50 | 22,796 68 | ............ | 233,692 43 |
| 1858 | 19,704 37 | ............ | 200,872 06 | 113,369 09 | 24,418 35 | 85,344 08 | 1,687 65 | 80 00 | 26,810 00 | ............ | 472,285 60 |
| 1859 | 18,046 22 | ............ | 353,487 66 | 92,452 04 | 31,081 00 | 77,299 11 | 3,224 42 | 777 50 | 26,962 29 | 757 45 | 604,087 69 |
|  | $247,846 99 | $18,907 67 | $981,546 52 | $1,248,511 80 | $170,241 65 | $199,168 85 | $4,912 07 | $10,505 24 | $245,060 58 | $14,791 22 | $3,141,492 59 |
| Bal. lapsed to C. Treas'y. | $21,809 23 | $15,717 20 | $1,636,631 69 | $17,519 44 | $15,453 10 | $2,356 81 | $787 93 | $309 11 | ............ | $28,115 07 | $1,738,699 58 |

3 2044 103 127 726